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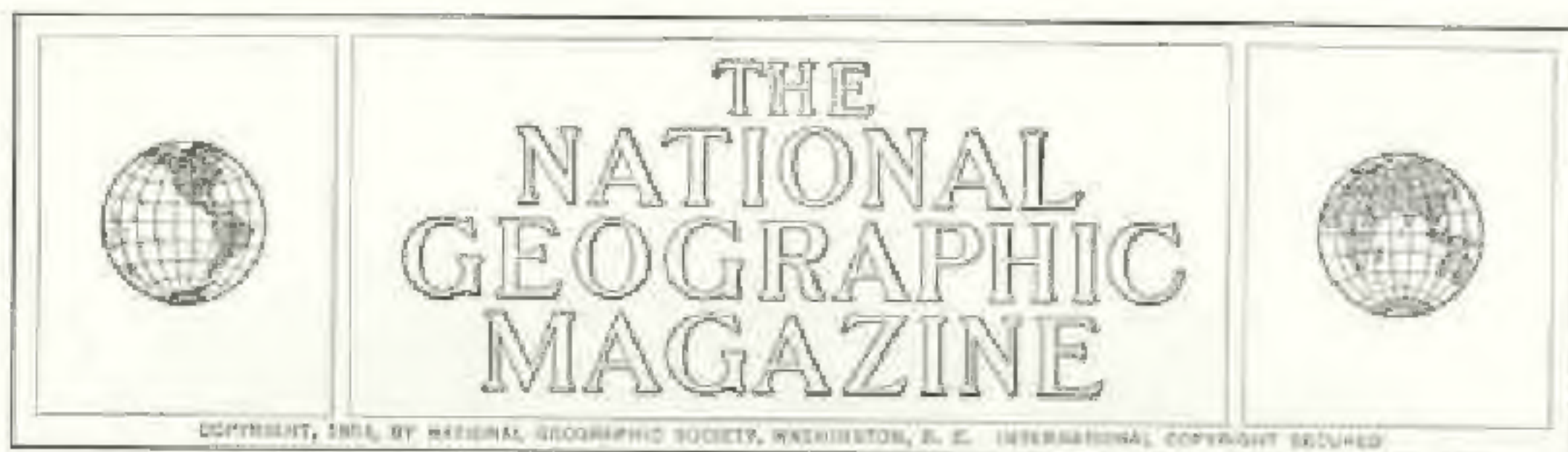
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New Guinea's Rare Birds and Stone Age Men

Filming Exotic Birds of Paradise and Living with Primitive Tribes,
an Ornithologist Scores Important New "Firsts"

By E. THOMAS GILLIARD

HERE in the cloud forest of New Guinea's central highlands the night had been long and wet, but dawn had nearly come now, and the rain had stopped. The two natives who had slept fitfully on a bed of leaves beside my cot crouched, shivering, over their smudgy fire.

To the tribesmen in a near-by hut I shouted, "Workem kil!" ("Get the food ready!"). Soon a big, jet-skinned mountaineer entered the shack carrying bread, a can of butter, and a pot of steaming coffee.

A few minutes later we took off through the dripping vegetation, feeling our way over a steep, muddy trail cluttered with fallen timber. Through rhododendronlike growth we climbed steadily to 7,500 feet until, just ahead, we made out our well-camouflaged objective—the 50-foot tower of poles and vines we had fastened together the day before. Up its shaky, slippery ladder we clambered, a small fortune in lenses and cameras swinging from our shoulders and necks.

On the Trail of a King

To an onlooker our patrol might well have appeared a sinister operation. But to me it suddenly seemed a little comic. Here I was, half a world away from my home in Manhattan, clinging to a flimsy rung high above a forest no white man is believed ever to have visited. Why? Just to see some birds!

For this I had bought, nine months before, food and equipment for 900 man-days in one of the remotest parts of the globe. For this I had stocked up with—among other things—enough yeast and flour to bake 200 loaves of bread, and half a dozen soccer balls

to give to important chiefs. In the National Geographic Society's headquarters at Washington, I had worked day after day striving to master the mysteries of electronic lighting and the complexities of special cameras.

Yes, all this just to see some birds. But what birds! Our quarry was no less than the birds of paradise—especially the most spectacular of them all, the King of Saxony. Only one specimen had ever been taken alive to a zoo, and that one died almost immediately.

No still pictures of this bird of paradise in its native habitat had yet been made. Until our 1950 trip to New Guinea two years before, only one or two white men had witnessed its peculiar, long-tailed dance of courtship.*

The King Wons a Queen

Despite the rarity of paradise birds, we had already seen their plumes by the score. Natives hunt them with the intensity of gold prospectors, and on special occasions wear fantastic arrays of plumes beyond all price. Reserved for chiefs are those of the King of Saxony, whose wooing we now hoped to watch (pages 444-445).

Reaching the top of the tower, I set up tripods, cameras, and sound recorder. Then I aimed a 16-inch telephoto lens at a little spirelike limb that rose in the mist above the crown of a subtropical forest giant.

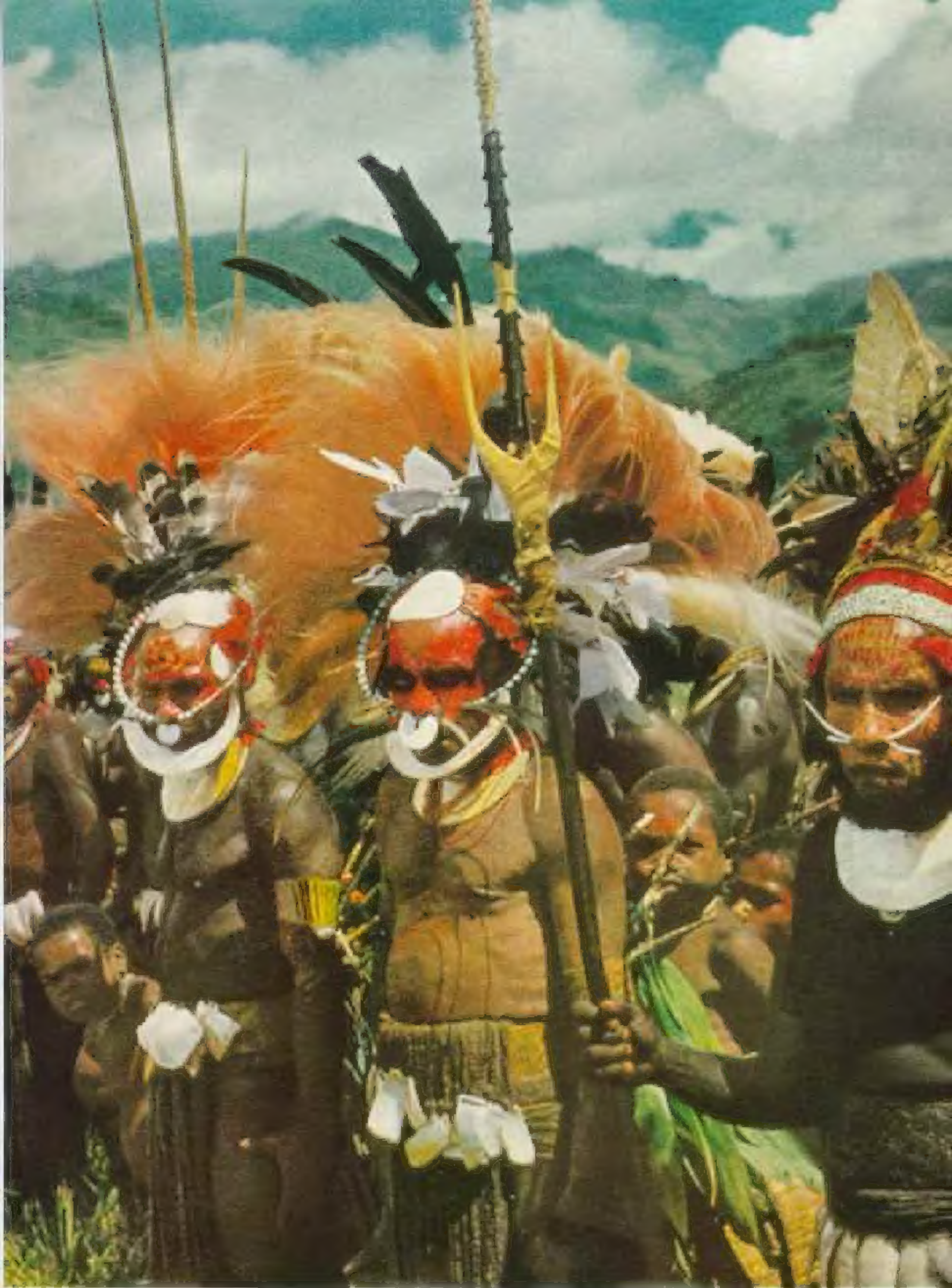
Presently, in the first rays of sunlight, I heard from afar soft hissing notes which sounded more reptilian than birdlike. My

* See "Strange Courtship of Birds of Paradise," by Dillen Ripley, NATIONAL GEOGRAPHIC MAGAZINE, February, 1950.



Stone Age Man Meets the 20th Century in New Guinea's Kubor Range

This de Havilland Dragon ferried the author from Lae into the 5,000-foot-high Wahgi Valley. Curiosity almost wrecked the plane when the men, gathered for a danax festival, rushed blindly across the landing field.



Spear Bearers, Resplendent in Plumes, Shells, and Paint, Welcome the Author to Kup

Many Kup people, remembering Mr. Gilliard from a previous journey, greeted him as an old friend. Father Michael Bodnar, a pioneer missionary, maintains the air strip; Kup is virtually inaccessible by land.

guide stiffened and pointed. We waited minute after long minute. At last a small bird, hardly larger than a robin, flew to the perch. Dipping and bowing, he began like a drunken devil to wave and toss his weird, exotic plumes.

Were they feathers? We knew they were; yet they strained credulity. Pointed, brilliant, they seemed to spring like horns from the bird's crown, trailing behind him in two fantastic parabolas. Here was the King of Saxony indeed, panoplied like a Teutonic monarch riding to battle with great plumes streaming from his casque of iron.

Through the binocular I saw that the bird's breast was egg-yellow, his plumes sky-blue. He grasped a slender vine and, after a few moments of nervous pawing, began to bounce up and down, like a diver testing a board. The short black-velvet cape covering his back spread out over his shoulders like the partly opened wings of a beetle.

Gradually the tempo of his bouncing increased. The magnificent plumes swept forward and down like the tines of a huge fork. Uncontrollably excited, the King became a trapeze artist. From his beak issued a series of hissing notes, like steam escaping.

I scanned the perch for the female bird who must be there. I could not spot her rather drab body, but neither had I been able to see her in 1950, the only other time I had witnessed this dance. Yet on the movie film we brought back it was possible to glimpse her demure entry into the nuptial chamber.

As suddenly as it began, the dance concluded. The King, reaching a climax of ecstasy, leaped upward in a great flutter of wings, then flew off to another of his dance trees, beyond our visual range.

Climax of Centuries-old Search

The scene we had just watched was, in a way, the culmination of a search some four centuries old. The date when the plumes of a bird of paradise first reached Europe is uncertain, but we know that the first definite description of them came from two skins brought back from the Moluccas in 1522 by Magellan's men on their return from the circumnavigation of the globe.*

Few things from the Orient stirred the imagination of Europeans more. The plumes of later specimens were attached to skins from which the feet and legs had been removed, a procedure still followed today by native collectors. Europeans decided that these extraordinary birds had no feet and that they must have been blown to earth from a celestial paradise.

The legend faded, of course, but the name remained: These were the "footless" birds of paradise—species *apoda*. And, because white

men over the years continued to rely exclusively upon aborigines to trap or shoot the specimens, the birds remained long among the least-known of all the spectacular forms of animal life inhabiting the world.

To dispel some of the mystery which still clung to these birds, I had led an expedition for the American Museum of Natural History, New York City, into remote ranges of New Guinea in 1950.† We had collected 171 species of birds, among them 19 forms entirely new to science. In addition, we had found the display grounds of bowerbirds and of some of the rarest of the birds of paradise.

How the 1952 Expedition Began

I had wanted, however, to go back again. We had done much, but there was much yet to be discovered, pinned down, recorded on sound track, film, and notebook. Thus I was elated when, at the Explorers Club in New York one evening, a tall, deeply tanned member approached me, introduced himself as Armand Denis, and suggested I organize another expedition to New Guinea.

Quickly we came to an agreement. Denis (producer of many fine films, among them *Dark Rapture* and *Savage Splendor*) would be the leader; I, the general manager. Robert Doyle, an Australian explorer; Robert Carmet, a French photographer; and young Henry Kaltenthaler, a Philadelphia botanist, would accompany us. So would Denis's wife Michaela, and my wife Margaret. Both were veterans of expeditions to Africa, Asia, the Philippines, and South America.

Our mission would be multiple: To film the Stone Age men who inhabit the land of the

* See "Greatest Voyage in the Annals of the Sea," by J. R. Hildebrand, *NATIONAL GEOGRAPHIC MAGAZINE*, December, 1932.

† See "New Guinea's Paradise of Birds," by E. Thomas Gilliard, *NATIONAL GEOGRAPHIC MAGAZINE*, November, 1951.

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Wrinkled Warrior Bears Plumes of Paradise Like a Blazing Torch in the Sky

New Guinea boasts perhaps the most splendidly arrayed men in all the Pacific. This highland "strong-fellow," or subchief, looking older than his 50 years, proudly carries the skin and plumes of an upended Greater Bird of Paradise (pages 437, 438, and 439).

His fur cap comes from the *kagul*, a forest marsupial related to the opossum. Green scarab beetles encased in orchid fiber and cowrie shells sewed to a headband serve as the jewels of his crown. A strand of pigtail around his neck, a beller shell on his forehead, and sections of mother-of-pearl on neck, chin, and nose complete the ensemble.

Pig grease and charcoal blackens his face in the approved New Guinea manner: the darker, the handsomer. Bow and arrows peep above his shoulder.





Wahgi Valley, Land That Time Forgot, Shelters a Hidden World of Stone Tools

Two decades ago Michael Leahy, a gold prospector, made front pages the world over by discovering this valley with its thousands of Stone Age savages. This vista confronted Mr. Leahy when he topped a mountain barrier 9,400 feet high. The Chimbu River snakes south through the Bismarcks (foreground) and across the shadowy Wahgi Valley toward the fog-shrouded Kubors. Bundi Track, a pioneer trail, scratches the landscape at lower right.



New Guinea, One of the World's Last Frontiers, Harbors a Paradise of Birds

Once German territory, North-East New Guinea is now administered by Australia under the United Nations. Last year the author made his fourth visit to the island, serving as manager and ornithologist of the American Museum of Natural History-Armand Denis Expedition. Mr. Denis, film producer and expedition leader, made a photographic record of New Guinea's birds of paradise and the people who wear their plumage, even as American Indians wore turkey feathers. His film is being released soon. Veterans of MacArthur's drive to regain the Philippines will remember the Papua campaign of 1942-43 and the Hollandia landing in 1944.

birds of paradise, to photograph the courtship and display of the birds themselves for the American Museum, and to make still pictures of many other birds and animals.

It was one thing, of course, to plan such an expedition from the comfort of our arm-chairs, but quite another to get it into territory long charted as "uninhabited." We never could have accomplished it without the sympathetic help and interest of the New Guinea authorities.

When, for example, we arrived at Lae, our jumping-off place on New Guinea's east coast, we found that air travel into the interior no longer looked quite as simple or safe as it had from New York. A rather dispiriting list of accidents, in fact, had piled up since our last flights out of Lae in 1930.

In the interim, the pilot of Count N. C. G. F. Gyldenstolpe, a Swedish naturalist, and all the count's scientific materials had been lost in 1951, smashed against a hidden peak of the Bismarcks. The pilot we had last flown with in New Guinea had crashed on a mercy flight two days after we left. Bill Lamont, veteran of our 1950 Mount Hagen expedition, had cracked up at Madang. Father Michael Bodnar had barely survived a wreck in the interior.

Even our own pilot for the forthcoming venture—the much-decorated wartime flyer, Robert Gibbes—had lost two planes in the previous two years. When my wife and I, then, climbed into a 15-year-old light plane for a reconnaissance flight with pilot Larry Crowley, we experienced just a touch of misgiving.

We took off safely, however, skimming the 100-foot-high matted forests which border Lae, and followed the broad valley of the Markham River (map, above).

Threading the Bismarck Passes

For an hour and 10 minutes we flew inland, until before us loomed the 12,000-foot peaks of the Bismarck Range, fringed with clouds. Dodging rafts of mist, Crowley spiraled upward, searching for an opening. At last he found one, and we bored through the Chimbu gorge and planed down a narrow valley. We headed toward a plateau which extends north from the Kubor Range in a series of lobes overlooking the Wapig River (opposite).

Spider-webbed with ancient trails, deeply scored here and there by wider roads, the area under cultivation looked prolific and luxuriant. Flat-topped promontories capped with casuarina forest and dotted with native gardens



* A Pack Train Treks Across Wasteland Trails in the Kubers

Early in the morning before a trip the expedition leader sprints out for the area's strong-fellow and tells him how many carriers are needed, whereupon the chief summons his followers with a bellow.

Just as a drum message is relayed in Africa, the call is picked up far down the valley and repeated again and again. So faithfully do New Guinea men observe this custom that messages swiftly travel as far as 50 miles. The wave of sound rising and falling over far-flung Western man.

Officers of beads and shells bring porters running into camp. Bearers carry 35 pounds each for a large pinch of beads a day.

This pack train heads over well-marked trails toward Mount O-Mac, lost in the clouds a two-day march away.

Inset: Stone artifacts hundreds of years old capture the attention of expedition leader Armand Denis and his wife Michela (page 487).

→ "Atop a column of porters, we crossed the Oming like a disoriented centipede," says the author.

Kidnappers by E. Thimote Gillard and Elmer K. Gaudin, American Museum of Natural History





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Fences? Nothing Could Stop the Swarms of Mosquitoes That Came Calling Every Day

John D. Lee, a former soldier, is seen here in a log cabin. He is a former soldier and a former member of the United States Army. The photograph was taken in 1900.



A Expedition in Cameroon in a Tree House And Tenses at a Leaf Bird

There is a house built up in the branches of a tree, and a man is sitting in it, looking down at a large, dark, cylindrical object, possibly a barrel or a large pot, which is part of a complex wooden structure. The background is filled with dense foliage and trees, suggesting a forest or a rural setting. The structure appears to be a traditional method of drying or processing agricultural products.

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stretched between the hills like outlying fingers (page 413). On one of these lay a green strip. This was our destination, the tiny airfield maintained by Father Hornum at Kap.

Threading the tight gorges of the Wahai, Crowley set our little plane down expertly, then swerved it sharply as a horde of savages converged upon us. They were not trying to scalp us—just to greet us (page 422).

We knew they had gathered for some extraordinary occasion, for they were all splendidly plumed in rare bird of paradise feathers.

They were followed a moment later by Father Hornum himself, one of those grand, self-effacing pioneers one meets occasionally in the big bush, who had in so many ways befriended us on our 1950 expedition.

We joined forces again with much back-slapping and enthusiasm, in which the good padre participated with even greater fervor when he learned we wished to plant a base camp in his backwash. For several hours we explored the vicinity, finally deciding on a near-by promontory for our site.

Then I sent word to Maima, chief of the Kubor tribes, asking him to come and see me on my return to Kap later. It was important that he should. Two years before, we had plunged deep into his realm, entering valleys no white foot had yet trod, and, with Maima's assistance, had climbed to the high plateaus where the rarest birds of paradise make their homes. With his cooperation, our second exploration might be even more profitable.

Bush Telegraph Brings Help

Back to Lae we flew and, on March 20th, returned at Gibbs's plane with two tons of gear and Robert Doyle. This time we set natives to constructing the buildings which would comprise our base camp at Kap—bathrooms, a mess hall, cookhouses, work sheds, a powerhouse, storeroom, and dormitories, the whole compound surrounded by a large fence.

By the time we were joined by Margaret,

native boys who had worked for us in 1950 had picked up word of our arrival on the bush telegraph. Beaming from ear to ear, they began to drift into camp. Among them were Mar, a good fixidermist ready for any job, and a few others, but equally ready to make himself scarce when confronted with more routine tasks; and Tai, courageous enough to climb the topmost pinnacle of Mount Wilhelm, but often more preoccupied with various love affairs.

Chief Maima Arrives—with Gifts

I hardly came Maima himself at the head of a retinue of 100 men, all decorated with the most vivid paradise plumes and bearing gifts of fresh, dead birds, and live pigs slung from poles. In one hand Maima clutched a spear; in the other, a badly worn soccer ball.

I recognized the ball as the one I had given his clan for its help two years before. After we had greeted each other as brothers, I withdrew to our storehouse with smug satisfaction at my forethought. Howls of pleasure greeted the new ball I brought.

Promptly I called a meeting of the mountain men. Forming a wide circle about me, they watched with speculative eyes as I unpacked a big case. From it I drew, one after the other, mounted birds of paradise.

First I showed them a male Greater bird, faded from its 50 years at the Museum. They shouted its native name, "*houmde!*". Then came the Superb, "*kongeral!*"; the Magnificent, "*kumbak!*"; Princess Stephanie's, "*meq!*"; the Sicklebill, "*tamba!*"; the Blue, "*gov!*"; the Grassland Bowerbird, "*cell!*"; and finally the most bizarre of all, the King of Saxony, "*kiabak!*".

Next I presented color pictures of themselves and their mountains which had appeared in the *National Geographic Magazine*. Joyfully they passed the pages around, marveling at their own likenesses.

Then I explained through my pidgin interpreter that this time I intended not to shoot or purchase birds, but to photograph them in their habitat. Holding up a gold-lip shell (one of 300 I had ordered from a pearling company on Thursday Island), I said that any man who could show me the dance land of a *houmde* would receive one shell, the equivalent of seven weeks of labor. I would also give one shell for a King of Saxony and for other varieties of birds of paradise. For a McGregor's bird, the price would be three: we ornithologists knew virtually nothing about this rare creature, not even whether it was a true bowerbird or a bird of paradise.

With that, our men vanished into the jungle, 50 strong. The hunt had begun.

A few days later the first messengers filtered

* Crowned Pigeon Carries a Lady Crest Like a Dowager's Frilly Hat

Given plumes beauty, the Crowned Pigeon, is as closely related to the New Guinea as are the birds of paradise. Like them, it was once much prized for gorgeous, lacy feathers. Today, although protected rigidly by government decree, it seems doomed to extinction like its relative the dove. Natives continue to hunt the chicken-size bird for its delicious white flesh. When one of a flock is shot, the others gather on low limbs, back at the hunters, and utter a similar fate. One man, son-director Paul L. Breese of Rome, Italy, has gathered in here (page 100).

Insert: Superb Fruit Pigeon (*Ptilinopus superb*) captured from Collier and New Guinea by Australia. Weaning a variety of course, it appears as easily as the fruit on which it lives.



New Guinea Belles Rouse Future Paces

From the woman above, here, that she has been with the mother. The children, too, are the same. In the morning, the women and girls go to the market to buy the things they need for the day. They go to the market to buy the things they need for the day. They go to the market to buy the things they need for the day.

When the women go to the market, they go to the market to buy the things they need for the day. They go to the market to buy the things they need for the day. They go to the market to buy the things they need for the day.

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back into camp with stories of discoveries made. I was in the cookhouse one morning when Tai, my No. 1 boy, rushed in to say, "Master, Master, bush Kanaka he talk. He talk talk plenty plenty bounce stop along diwa, belong em. Plenty man, e Mary. Sing-sing morning time true." (Kanaka man says lots of bounce come to his trees. Many males and females go through the noisy courtship dance every morning, early.)

That sounded good to me, of course. The following day at dawn I took five men, my cameras, binocular, axes, and emergency cover to the place which the native had spotted. It was a clump of casuarinas two hours' walk distant, the site of an old native graveyard.

From 400 yards away I could hear the high-pitched cawing of what seemed to be crows, interspersed with low, repeated growls. In the lacy top limbs a dozen birds flew about excitedly. Crawling through the grass with great caution, I reached the butt of a large tree where I could lie without being seen.

Strange Antics of Courtship

Looking up, I saw on a limb high above me the most gorgeous bird I had ever laid eyes on. The sun's rays, shining through the leaves illuminated his perch, and, against the dark green of the foliage, his flame-colored flank plumes shone like live fire.

Slowly he hopped up the branch, dipping his head in a snake-like manner, grasping at little twigs and knobs and shaking them, his wings partly open and his plumes nervously twitching. Then, at the apex of the branch, he turned sidewise and, like a cat jumping with both feet at once downstairs from step to step, he made a series of little leaps down the pencil-size incline to the bottom.

Here, suddenly, he raised his wings, lowered his neck in a heronlike crook, and began to thump the wrists of his wings above his back—rapidly and strongly enough so that I could hear them distinctly 60 feet away. At the same time he cast his plumes upward and backward in a carving spray. The whole rear of his body shook like a feather duster.

Two other males flew to limbs nearby. One of them dared to land near the display perch itself, only to be charged and driven off by the indignant owner.

As for the females, six of them fluttered around within 5 to 50 feet of the dancer limb. For the most part, they sat quietly about to the male's antics; but when he became greatly excited, lowered his head, and emitted a number of low, burring growls, they flew to perches directly above his proudly plumes, and even down to a spot beside him.

Once, in Australia's Taronga Zoological Park, I had seen an Emperor of Germany Bird

of Paradise reach such a peak of ecstasy that he swung head down from his perch like a shimmering pendulum, his plumes cascading from his flanks like fragile white fans. As I watched the Greater bird preening and prancing along his limb, with head low and plumes high, I wondered if he might do the same.

And he did. A brilliant ball of plumage, he tumbled forward and swung beneath the perch, luminescent in the morning sun. A female flew to the limb and stood just above him. Reaching up, the male pecked and fenced with her in a kind of continuation of their ritual. Then, as if upon a signal, the dance ended, and all the birds soared off toward a large wooded canyon to feed.

Back at camp we quickly organized a safari to return and capture this unusual dance on film. Thanks to the American Museum and the National Geographic Society, I had been showered with more elaborate equipment than any ornithologist of my acquaintance has ever carried into primitive country.

I had been forced, in fact, to train my bearers like an army mortar squad. At the head of my unit I placed a man with my color camera; attached to it was a reflex housing containing a 400-mm. telephoto lens. Behind him came a bearer with another camera, mounting a 200-mm. telephoto. Both cameras were mounted on ball-socket tripods.

Then came six men, each carrying a 35-pound power pack capable of producing a 2,000-volt flash for the speedlights. Next followed men with huge coils of rubber cable with water-tight couplings, an automobile battery, and boxes of extra equipment and film. I had only to sing out and this platoon fell in with a minimum of confusion; we were off.

Trials and Tribulations

Unfortunately, on many occasions we resembled the King of France who marched up the hill with all his men and then marched down again. Nature seemed to conspire against us. Mist formed on our lenses. Persistent rain soaked our power packs—and detonated them with a shotgun blast that cleared the bush of every bird in the area. Worst blow of all, our electronic lights, on which we had placed such hope, proved tremendously effective scarecrows.

We knew well how wary the Greater Bird of Paradise is—any bird of paradise, for that matter. Yet we had thought that by wiring the dance trees unobtrusively and positioning the lights with care, we could then retreat to our blinds many feet away and obtain photographs of great clarity, taken at 1/5000 of a second.

It was not to be. Even though we left the lights in place and went away for weeks at a time, the skittish birds never accepted them.



National Geographic 437 Vol. 10, No. 10, 1924, p. 255. Photo by A. S. Rehn.

Fringes Rise and Fall Like a Ballet's Skirt as a Paradise Bird Dances in a Tree-top

Only the Greater Bird of Paradise yields to the other 200,000 species in the world in beauty and grace. Its feathers and a crown of blue and white feathers are the most perfect and regular in the world.



* Shimmering Red Ibis: Worth a Girl's Kisser from the Tail of a Coloured Cuckoo

The Ibis is a bird of the tropics, and is found in the West Indies, America, and the East Indies. It is a large bird, with a long neck, and a long bill. It is a very beautiful bird, with a green body, and a red head. It is a very common bird, and is found in many places. It is a very useful bird, and is used for many purposes. It is a very interesting bird, and is worth a girl's kisser from the tail of a Coloured Cuckoo.

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A Lake and Fishery in India.

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Native Customs

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A Bedigebul Boy Carries New Guinea's Badge of Victory

Aboriginal warriors of the mountains and plains of New Guinea, the island of New Guinea, are now fighting a war of independence. The people of the island, with their long, dark, curly hair, are now fighting a war of independence. The people of the island, with their long, dark, curly hair, are now fighting a war of independence.



'Young Fella Mary' Wears the Cape and Shield of a Superb Bird of Paradise

From the Tropic of Cancer to the Tropic of Capricorn, the 'Young Fella Mary' wears the Cape and Shield of a Superb Bird of Paradise. The Cape is a large, white, feathered collar that is worn around the neck. The Shield is a large, white, feathered collar that is worn around the neck. The Cape and Shield are made of the same material and are worn together. The Cape and Shield are worn by the 'Young Fella Mary' in a way that makes them look like a single piece of clothing. The Cape and Shield are worn by the 'Young Fella Mary' in a way that makes them look like a single piece of clothing.

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✓ Turquoise Chest Shield Gleams Like a Mirror

When the 'Young Fella Mary' wears the Superb Bird of Paradise, the Turquoise Chest Shield gleams like a mirror. The Turquoise Chest Shield is a large, white, feathered collar that is worn around the neck. The Turquoise Chest Shield is made of the same material and is worn together. The Turquoise Chest Shield is worn by the 'Young Fella Mary' in a way that makes them look like a single piece of clothing. The Turquoise Chest Shield is worn by the 'Young Fella Mary' in a way that makes them look like a single piece of clothing.

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King of Saxony Dives a Giant Fork Hung with Waxy Blue Flaps Like Cellophane

A colorful, elegant King of Saxony, one of the most beautiful of the birds of the tropics, has been seen here. The bird is a member of the family of the waxy blue flaps like cellophane, and is a member of the family of the waxy blue flaps like cellophane.

Some of the King of Saxony's most beautiful features are its long, pointed beak, its dark plumage, and its waxy blue flaps like cellophane. The bird is a member of the family of the waxy blue flaps like cellophane.

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The King of Saxony is a member of the family of the waxy blue flaps like cellophane, and is a member of the family of the waxy blue flaps like cellophane.

Queen of Saxony Appears Drah Compared to Her Elegant Mate

The Queen of Saxony is a member of the family of the waxy blue flaps like cellophane, and is a member of the family of the waxy blue flaps like cellophane.

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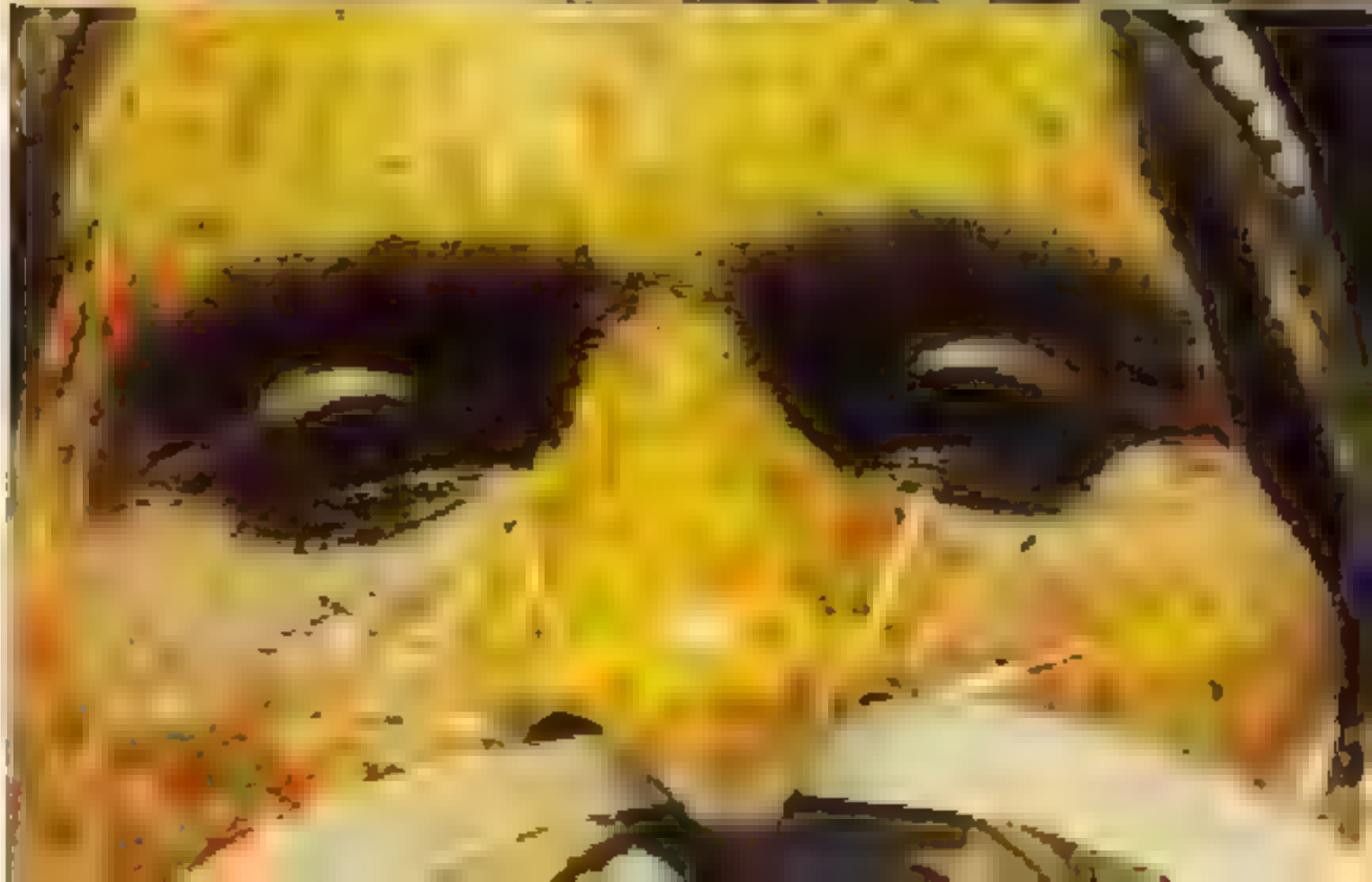




* Highland Cows Prize Saxony Plumes

The Highland Cows, which
thrive on the high mountains and
the valleys of the Scottish
Highlands. The cows are of
various colors, but the most
common is the black and white
Highland Cow.

Highland Cows are known
for their resistance to disease
and their ability to thrive in
the most difficult conditions.





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Lesser Bird of Paradise Resembles a Sharp-tailed Finch Representing a Finch

Many people are familiar with the sharp-tailed finch, a small bird with a long, sharp beak. The Lesser Bird of Paradise, however, is a much larger bird with a long, dark tail. The Lesser Bird of Paradise is a member of the same family as the sharp-tailed finch, but it is much more colorful and is found in a different part of the world.

Delicate as Moth Antennae,
 Fernlike Crests Rise
 from MacGregor's Brow

The cap of the MacGregor's Bird of Paradise, *Macgregoria splendens*, is not unlike the cap of a butterfly.

The bird is a member of the family *Paradisæidae*, and is found in the New Guinea region. It is a very beautiful bird, with a long, slender body, and a long, thin beak. The male has a long, thin crest, and a long, thin tail. The female has a shorter crest, and a shorter tail.

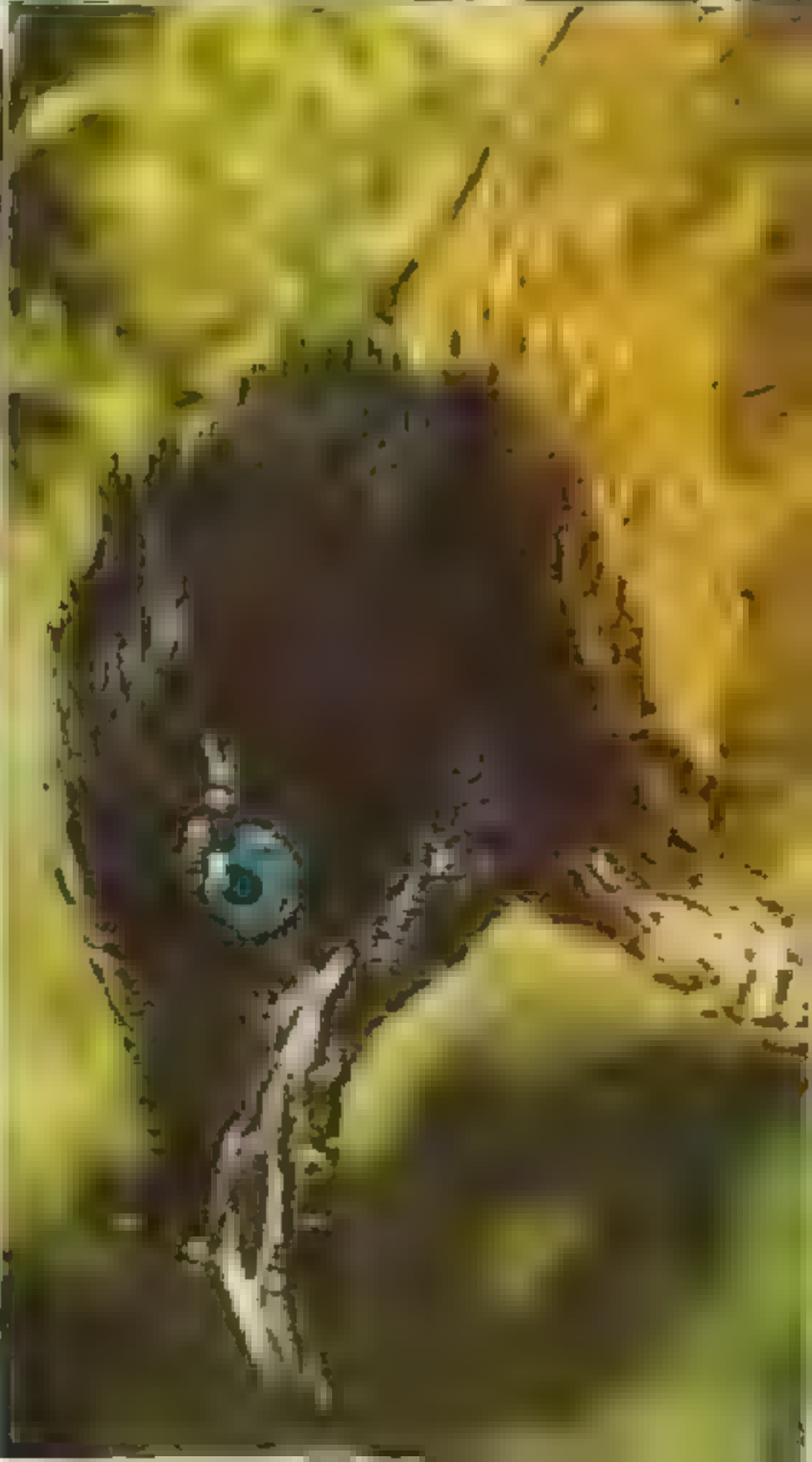
The bird is found in the New Guinea region, and is a very beautiful bird. It is a member of the family *Paradisæidae*, and is found in the New Guinea region. It is a very beautiful bird, with a long, slender body, and a long, thin beak.

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The bird is found in the New Guinea region, and is a very beautiful bird. It is a member of the family *Paradisæidae*, and is found in the New Guinea region.

Macgregoria splendens





Princess Stephanie's Name the Children in former old Wilhelms 110
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Winter Invades a Bowerbird's Pisheate Bridal Chamber

John and I are doing Edmund's Howard Hughes book in the 24th issue of the *Journal of American Studies*. The book will be published in the next few months. I have also been working on a book about the construction of the American home in the 19th century and how it changed. I am also working on a book about the history of the American home.

• Downy Woodpeckers Attract Vines with Shiny Berries and Stones

University of New York, 1991. The purpose of this study is to investigate the relationship between the degree of the student's involvement in the learning process and the degree of the student's achievement. The study is a quantitative study. The data were collected from 100 students who were enrolled in the first semester of the first year of the Faculty of Education, Karaman University. The data were analyzed by using the Pearson correlation coefficient. The results of the study show that there is a positive correlation between the degree of the student's involvement in the learning process and the degree of the student's achievement.





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Our intentions may have been more honorable or innocent than those of the natives who kill them with shotgun and bow and arrow, but the birds apparently assumed that we had rigged some devilishly lethal device that should be shunned at all costs.

Our expectations, dashed by this first encounter with the Greater birds, were raised by the addition to our party a fortnight later of Robert Carmet, who has made excellent wildlife movies in Africa and elsewhere.

Carmet, it turned out, had been able to take only \$84 with him from France. Yet he had made his way half around the world and arrived on time, in sneakers, to be sure, and not much else, but with cameras that rivalled my own.

We began planning a trek into the 12,000-foot mountains of the Kubor. Carmet remarked rather testily that the highest he had ever climbed was into the seat of a jeep station wagon, but he exchanged his sneakers for spiked boots willingly enough and, in the early hours of an April morning, our boss boy sang out for a party of bearers.

From under my mosquito net I heard the hellowed notes picked up by natives on the other side of the valley and relayed, in dwindling but still awesome volume, across the forests of the Wahgi and the Oming Rivers.

By 5 a.m. "seven-fella ten men" had assembled outside camp. We loaded these 70 bearers with tents, food, cameras, lights, weapons, and other gear and set off over hilly grasslands through Chief Maima's province (page 428).

In 10 days we reached the north slopes of the Cambia region, true Stone Age territory. Few natives here had even seen steel. Beside their low little grass huts lay their own tools—stone axes ground in the age-old manner on a dampened sandstone.

White Woman Amazes Natives

My wife was the first white woman these people had ever seen. They greeted her with amazement, dancing and howling around her. One huge native, coated with pig grease, hoisted her aloft and carried her through the procession for 20 or 30 yards.

Food proved no great problem. In exchange for salt, razor blades, powder paint, and matches, the natives brought us string bags of sweet potatoes, sugar cane, pigs, chickens, and even a few eggs. They wanted our trade goods; yet we noted that they had been able to live without them very well.

Fire, for example, they make by plucking a dried vine from their string aprons, threading it through a cleft stick, and sawing it back and forth until, under friction, it breaks into a punklike glow.

Salt they manufacture by soaking bundle after bundle of dried grass in salt springs. These are then thrown on the fire and burned. In the ashes a salt cake forms amid the lye. When it is thick enough, they remove it and bind it with others into disks about the thickness of three or four phonograph records.

The Kator people still make most of their decorative eyes and paints from seeds, soft stones, clays, and ashes, but quantities of beads from Czechoslovakia and Italy have filtered into the interior from the coast. We saw scarcely an aborigine who wasn't festooned with beads as a gypsy fortuneteller.

Murder in the Stone Age

We noted these little encroachments of civilization with some alarm, not simply because we disliked seeing one of the world's last pockets of Stone Age people lose its pristine uniqueness, but because, paradoxically, it is the coming of the white man which tends to make the native impetuous.

Almost invariably explorers in New Guinea have found the aborigines friendly when first approached. Only after they have become aware of the treasures which the white man carries—shells and axes and trinkets—do their thoughts turn to murder and loot.

Hemuth Baum, a veteran of many sorties into the interior, died with a Kukukuku stone blade in his skull a few seconds after he had opened his trade box and revealed half a dozen steel axes. The Leahy brothers—Michael and Pat—suffered near-fatal wounds in an attack on their camp in 1931 by natives who had always been quite amicable.

Nevertheless, as an ornithologist, I felt that whatever risks I was running among these Stone Age primitives were greatly outweighed by the rare opportunity I had to study New Guinea's strange birds and people.

And in New Guinea, in contrast to parts of Europe and America, the naturalist is regarded as almost sane. Here the savage is vitally interested in the plants and insects and animals of his region. To him, the white men who come to scratch for yellow metal in his stream beds are the ones who are "long-long"—crazy.

The native, moreover, is as well informed about flora and fauna as he is interested. Without any sort of written language he manages, nonetheless, to pass on from generation to generation a steadily increasing store of expert knowledge. I didn't find it always easy to believe, yet when I tested the Kubor people on some particular question, they invariably came through with top marks.

For example, a boy wandered into camp with a drab little nest made by a bird which he called a *dengulep*. I knew that this was a sort of flycatcher rarely seen in the Kubors.





Yet when I questioned a dozen different natives about the nest, each identified it correctly and without hesitation.

It was for this reason that I put great store by native opinion when we turned to one of our prime objectives in New Guinea, the settling of an old issue among ornithologists as to whether MacGregor's is a bird of paradise or a bowerbird.

The chief difference between the two is that bowerbirds usually clear a bit of ground and build their courtship chambers there, while birds of paradise customarily perform their love dances in trees. Birds of paradise, too, tend to have unusually developed plumes in contrast to the bowerbirds' short and inconspicuous appendages.

We thought we might have the definitive answer when a native who had taken part in our dagnet operation finally brought in a live MacGregor's. It was an adolescent male and so overwhelmed by being captured that I sat numbly, with it protest, as I frantically took portraits of it in color.

Yet even after I examined its six curious orange crest plumes, which it can retract into a slot of darker feathers on its crown, I could not say for sure, on this evidence alone, that it was a bird of paradise. Nor was the size and shape of its tail a determining factor.

Another consideration which had a bearing on my decision that this was no bowerbird was that the natives were positive it did not build a courtship chamber on the ground, as do most bowerbirds. Nor could we, in all our searching, ever find such a bird displaying there. As one ornithologist, I am willing to take the verdict of these local experts: MacGregor's is a bird of paradise (page 447).

Finding the King of Saxony

At long last, while we were ransacking the Kabor Range, we caught up with the King of Saxony (page 444). Margaret and I had finished supper and were sitting by the camp fire, huddled against the chill, when we dimly made out a wavering figure coming down the dark forest trail. Presently a gleam-eyed native, virtually naked, stepped up to the flames, sq rattled, and began to warm his hands.

It was a custom I knew but never wholly relished: no traveler in these parts is ever denied the hospitality of one's fire. This is all very well, but it can become a little trying to have chops dropping in and out of one's hut at any hour of the day or night, helping themselves to "gaw siks" from the blaze, or just subsiding onto their haunches and staring.

This time, however, our irritation quickly evaporated when Tai, my "turn-talk," informed me, "Dis fella be talk—sibaba grass belong em long fella to mas, be stop long hop."

In short, a male King of Saxony Bird of Paradise had been sighted a day's walk distant. We needed no further urging. Next morning, and for several thereafter, we reconnoitered sudden tracks on the flanks of Mount O-Mar. Finally we lit upon three trees within a mile of each other where various Kings displayed their plumage daily.

One of this trio was photographically impossible; at the second, the bird in residence was molting. So we picked the third and built near it our lofty, ransackable tower.

Thus it was that I found myself, on that memorable morning, watching with avid eyes the first only one or two of its movements ever seen before—the love dance of the King.

In the days that followed, we tried repeatedly to place that spectacle on film. With still pictures we had poor luck; the problems which had defeated us with the Greater Bird vanquished us once more. But with movie film and with sound recordings we succeeded reasonably well.

Sicklebill Rattles Like Machine Gun

If the King gave us one bird of paradise feather for our caps, other species were just as generous. We photographed more than 100 species, most of them never filmed before, including the rare river duck, *Sulzadorina*, and the little mountain parrot, *Ptilinopus pictus*, which we had discovered in 1950.

Scientists recognize 42 species of birds of paradise; in New Guinea there are 20 known ornamented species. Of the latter we observed 16 and filmed 12 in color.

Particularly entrancing was Blood's Sicklebill Bird of Paradise (page 449). We found its mating tree 7,300 feet up Mount O-Mar and built near it a pandanus-thatched hovel from which, one frigid morning, we watched toraha perform.

From its perch the Sicklebill would lose a machine-gunlike burst of bass notes. Then, as the sound died away into the cathedral hush of the forest, the bird would begin to crouch like a grouse, beating its wings against its sides and making loud, cracking reports which quite mystified us. It seemed impossible that wings alone could make such a noise.

Just as bizarre in a different way was Princess Stephanie's (page 449). This bird of paradise has a very long black tail, a jewel-like head, and a quiet mewling call that is uncannily feline. It displays in trees cloaked in moss and flamboyantly decorated with all manner of ferns, plants, and orchids.

Its dance, which we were among the first naturalists to see in its wild setting, began with the male slowly picking its way along a heavily festooned limb. Its tail, nearly two feet long, trailed among the orchids like a

Brown Crabs Lose Explorers' Appetites

Several types of soil conditions are found in the area, but very little of the New England type is reported in the literature. Table 1 lists some of the soil conditions that are commonly found in the area.

For example, the *spontaneous* loss of H_2 from H_2O at 25°C is 4×10^{-33} molecules $\text{cm}^{-2} \text{s}^{-1}$. The *thermally* induced loss of H_2 from H_2O at 25°C is 10^{-20} molecules $\text{cm}^{-2} \text{s}^{-1}$. The *photo* induced loss of H_2 from H_2O at 25°C is 10^{-10} molecules $\text{cm}^{-2} \text{s}^{-1}$.

Now, however, the FBI is in a bind. It has no way to tell if the FBI's own records are accurate, and it has no way to tell if the FBI's own records are accurate.

[illegible]

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1. *Journal of the American Medical Association*, 1997; 277: 1033-1037.





Drainage Ditches Given a Wall-to-Wall Pattern Across Walig Valley Sweet-potato beds
A few years ago the drainage was not so regular. One crop of 10,000 pounds was
lost when the ditches were not so regular.



Fingers of Fire Race Each Year Across the Grass lands of Central New Guinea

Abundant in the lowland grasslands of New Guinea, the fireweed plant, *Chamaecrista nictitans*, is a common sight in the lowland grasslands of New Guinea. The plant is a member of the Leguminosae family and is a common sight in the lowland grasslands of New Guinea.



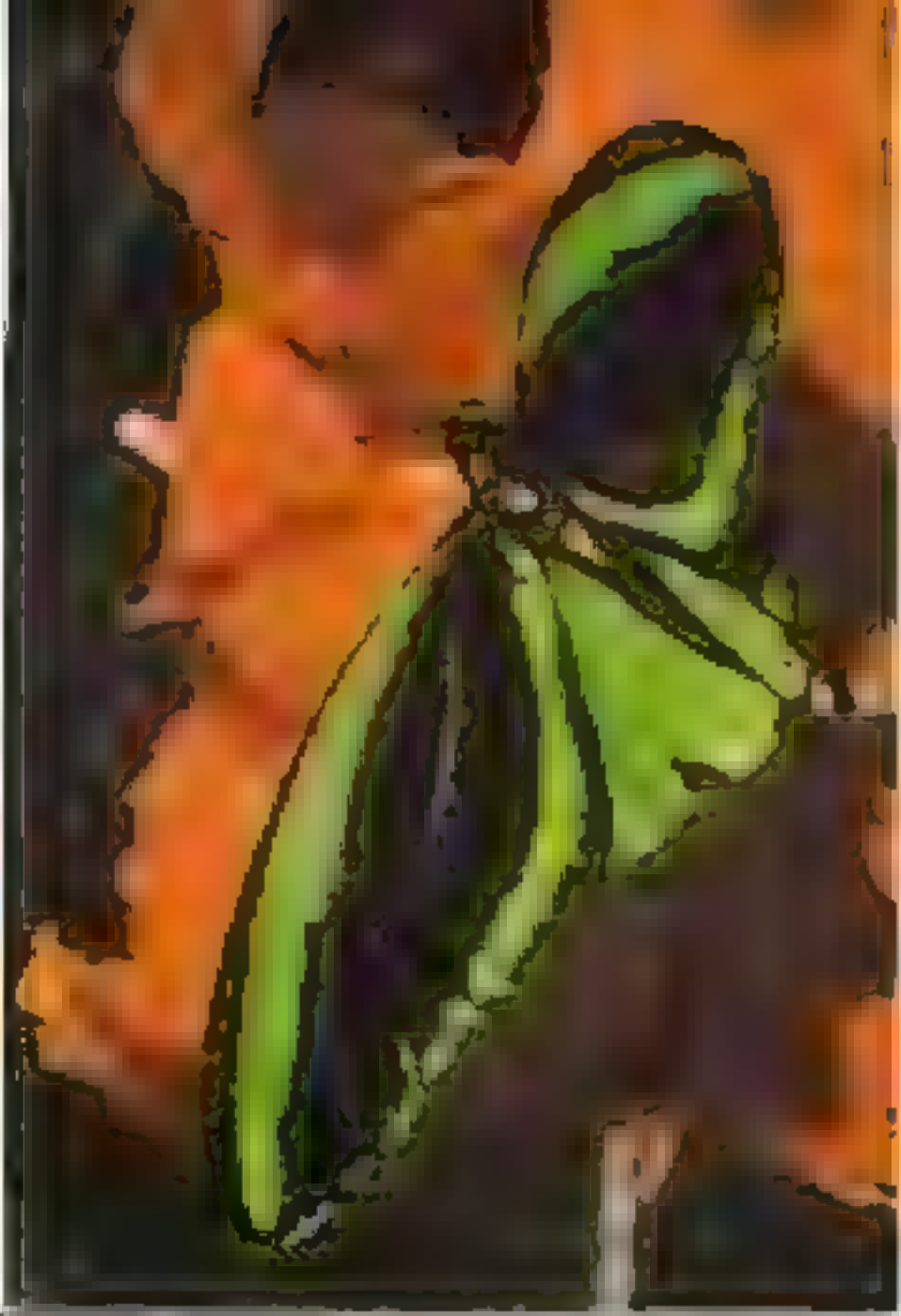
Only Insects Need Fear Frognoble's Bludgeon Bug and Dreadful Doves

No one told the children of the forest to be
 afraid of the Great Frognoble, for he is a most
 terrible beast, and his name is feared by all
 who live in the forest. He is a most terrible
 beast, and his name is feared by all who live in
 the forest.

General Frognoble is a most terrible beast,
 and his name is feared by all who live in the
 forest. He is a most terrible beast, and his
 name is feared by all who live in the forest.

The children of the forest are most afraid of
 the Great Frognoble, for he is a most terrible
 beast, and his name is feared by all who live in
 the forest.

The children of the forest are most afraid of
 the Great Frognoble, for he is a most terrible
 beast, and his name is feared by all who live in
 the forest.





Kartabo's Examples Rite, News and Story in Public Assembly

The Kartabo of northern
 British Guiana have long
 been justly celebrated for
 their art. Their traditional
 mask dance, for example, was
 an important social event.
 As the mask dancers sang
 and danced up and down
 the length of the village
 street, the people of the
 village gathered to see
 the dance. The dance
 was a social event, and
 the people of the village
 gathered to see the dance.

The dance was a social
 event, and the people of
 the village gathered to see
 the dance. The dance was
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 people of the village
 gathered to see the dance.

The dance was a social
 event, and the people of
 the village gathered to see
 the dance.

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Cuckoo-tailed Parrot Glows with the Hues of a Chieftain's Paintbox

100 ft. high, open, scrubby forest, New Guinea. Photographed by the author. The bird is a male. Cuckoo-tailed Parrot, New Guinea. The bird is a male.

train. Its curved bill darted and nudged among the moss and flowers.

Suddenly, in a series of graceful leaps, it nipped to a bare limb about six inches in diameter and some 80 feet above the ground. With my 8-power glasses glued to my eyes, I watched it quickly flex its wings. It curved its tail inward, spread wide the tips of its two immense central plumes, and waved both tail and wings together in nervous but related cadence. For half a minute it held its wings cocked far behind its back, so that the wrists touched; thumped several times like the Greater Bird; then, as abruptly as it had begun, relaxed, sat sedately for a little while, and flew away.

Fire Menaces Blue Bird's Home

From these ventures on Mount O'Mear we turned for a quick two-week side trip to Mount Hagen in search of the elusive Ribbon-tail and the Golden-crowned Bowerbird, which in 1950 we had discovered and named *Trochiloides sanfordi*, after our friend and sponsor, the late Dr. Leonard C. Sanford.

We learned much on Mount Hagen about hybridization of the long-tailed birds of paradise; we obtained some excellent photographs of the Wattled bird and Loria's Bird of Paradise (page 452); but the Ribbon-tail and Golden-crowned gave us the slip.

Our disappointment was keen, but it was softened by the arrival at our base camp of young Henry Kaltenthaler, the botanist from Philadelphia. I had saved for him several particularly sticky assignments, including the photographing and recording of the Blue Bird of Paradise (page 441).

Henry shared my concern over the fate of this bird—*Paradisaea rudolphi*—threatened with extinction by native hunters and farmers. The most delicately beautiful and lovelike of birds of paradise, this creature has about it an aura of romance. Crown Prince Rudolph of Austria, for whom it is named, was the ill-fated hero of the tragic Mayerling story. The target of native collectors for a good half-century, the Blue Bird is now gravely reduced in numbers. More serious still, deforestation is wiping out its very home.

As primitive man has pushed up from the coast into the interior, he has stripped the upper reaches of the Markham, Ramu, Sepik, and Wahgi valleys of their timber and left a sea of inflammable grass. When fire strikes, 30-foot palisades of flame sweep these upland meadows, charring the earth and driving bird and man into cramped gulches (page 459).

The Blue bird is all the more vulnerable in that it will not live higher than 6,500 feet, no matter how inviting the forest; its range stops there with the precision of a topographer's

contour line. Yet the line of destruction now tops to 7,200 feet in the Kuluor Range and up to 8,300 feet in the Chimbu gorges.

Result: Where thousands of Blue birds once flittered and danced in the forests, it is hard now to find a few inbred coveys backed into precipitous cul-de-sacs. One of the most fortunate memories I retain of the island is the spectacle of a male Blue bird I saw at Katunabag, perched on a fire-blackened tree trunk in the heart of a burned-out wilderness.

Can anything be done to check these ravages? Our Australian member thought so. What is needed is a bird of paradise reservation, rather like Africa's Kruger National Park, in which primitive man can be taught to live side by side in harmony with those treasures of Nature that can be found in New Guinea alone. It would not be too difficult, Bob Doyle pointed out, to administer such an area through the government's district officers, men well-trained, fair, and much respected by the highlanders.

This project, however, is still but a gleam in a naturalist's eye; and in the shorter domain still left to the Blue bird we found slim photographic pickings. We were lacking in our pursuit of the Magnificent Bird of Paradise (page 440).

We discovered, in fact, no fewer than five dance grounds of the Magnificent, all within two miles of our base camp at Kap. Hitherto, kumuk's courtship had been observed and fully described by only one white man—Dr. Austin L. Rand, of the American Museum of Natural History, in "The Bird of Paradise of the Richard Archibald Snow Mountain Expedition."

Altogether, Kaltenthaler, Robert Doyle, and I spent 14 man-days in blinds close to the Magnificent's dance grounds before we were able to snare the bird's choreography on film. We felt well rewarded, however, for the antics of this strange bird with its poke-whistle voice are among the most intriguing in the bird kingdom.

Dance of the Magnificent

Golden-taped, the Magnificent boasts a shining blood-red back patch and a chest shield of blackish green. For its dance it selects a tree of broom-handle size, deep in the forest and usually on a steep slope. Meticulously it clears the ground beneath the trunk and snips the leaves overhead to spotlight its arena with dramatic shafts of sunlight.

When all is ready, the male screeches his invitation to those whom it may concern and whirs down upon his sharply slanted stage. There he flexes his plumage and preens slowly and with obvious pride up and down

* See "Unknown New Guinea," by Richard Archibald, *National Geographic Magazine*, March, 1941.

“I moved up to the
 5th floor, where the
 of the World's Fair

1. *Explain the importance of the following factors in the development of a country's economy:*
 (a) *Human resources*
 (b) *Capital resources*
 (c) *Technology*
 (d) *Government policy*
 (e) *Infrastructure*
 (f) *Trade and international relations*
 (g) *Education and health*
 (h) *Environmental factors*
 (i) *Political stability*
 (j) *Legal system*
 (k) *Financial system*
 (l) *Labour market*
 (m) *Industrial structure*
 (n) *Export and import composition*
 (o) *Foreign investment*
 (p) *Research and development*
 (q) *Entrepreneurship*
 (r) *Government expenditure*
 (s) *Public sector*
 (t) *Private sector*
 (u) *Non-profit sector*
 (v) *Voluntary sector*
 (w) *Third sector*
 (x) *Quadrant*
 (y) *Quintile*
 (z) *Decade*
 (aa) *Century*
 (ab) *Millennium*
 (ac) *Era*
 (ad) *Period*
 (ae) *Phase*
 (af) *Stage*
 (ag) *Step*
 (ah) *Level*
 (ai) *Grade*
 (aj) *Rank*
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1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

2. The second step is to gather relevant information and data. This may involve research, consultation with experts, or collecting data from various sources.

3. The third step is to analyze the information and data. This involves identifying patterns, trends, and relationships that can help to answer the question or solve the problem.

4. The fourth step is to develop a solution or answer. This involves applying the analysis to the specific problem or question and formulating a response.

5. The fifth step is to evaluate the solution or answer. This involves checking the results against the original requirements and ensuring that the solution is valid and effective.

6. The sixth step is to communicate the solution or answer. This involves presenting the results in a clear and concise manner, using appropriate language and format.

7. The seventh step is to reflect on the process. This involves thinking about what was learned from the experience and how it can be applied to future tasks.

8. The eighth step is to document the process. This involves creating a record of the steps taken and the results achieved, which can be used for future reference.

9. The ninth step is to review the process. This involves looking back at the entire process and identifying any areas for improvement or further action.

10. The tenth step is to implement the solution or answer. This involves putting the solution into practice and monitoring its effectiveness over time.

[illegible]

... ..

1. *Phragmites* (1990)

Age Group	1980	1990	2000	2010	2020
0-14	25%	20%	15%	12%	10%
15-24	15%	12%	10%	8%	7%
25-34	10%	12%	15%	18%	20%
35-44	8%	10%	12%	15%	18%
45-54	5%	8%	10%	12%	15%
55-64	3%	5%	8%	10%	12%
65-74	10%	12%	15%	18%	25%
75+	2%	3%	5%	8%	10%

2007



Compare PyMDE with the following three products and a

[illegible]

The first part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1.1) as $\epsilon \rightarrow 0$. In the second part, we study the asymptotic behavior of the solutions of the system (1.1) as $\epsilon \rightarrow 0$. In the third part, we study the asymptotic behavior of the solutions of the system (1.1) as $\epsilon \rightarrow 0$.

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12.1





498 THE JOURNAL OF AMERICAN ETHNOLOGY

SHAN-BA CHALIMNEN SPLIT CLOSURED LOGS FOR A WILDF RIVER SUSPENSION BRIDGE

During the day we made many good photographs of the men from an elevated position, and of the suspension bridge from below. The bridge was made of split logs, and the men were using the logs to make the bridge.

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Man's Work Is Never Done

During the day we made many good photographs of the men from an elevated position, and of the suspension bridge from below. The bridge was made of split logs, and the men were using the logs to make the bridge. The men were using the logs to make the bridge. The men were using the logs to make the bridge.

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Please Stay with Us! Owl-winged Clade Bring Gifts to the Departing Expedition

The Owl-winged Clade, a group of indigenous people, are shown here bringing gifts to the departing expedition. The gifts are made of yellow and orange plant material, and are placed on a large pile. The individuals are wearing traditional headgear and are standing in a forest setting.



Reeds, Petals, and Shells Make Mustaches for Pithoracot Nays

The young Pithoracot Nays are often seen wearing elaborate face paint and jewelry, including necklaces made of reeds, petals, and shells, which they use to decorate their faces and bodies during traditional ceremonies.

A Nurbu Mountaineer Leads a Team in the Ceremonial Spear

Nurbu, a mountaineer and a member of the Sherpa community, is seen leading a team of climbers in the ceremonial spear, a traditional practice that involves using a long, thin spear to climb steep, rocky terrain.

Mountaineering is a popular sport in Nepal, and the ceremonial spear is a traditional practice that involves using a long, thin spear to climb steep, rocky terrain. The spear is made of wood and is decorated with colorful patterns and designs.

Source: <https://www.nepalnews.com>

Image: <https://www.nepalnews.com>





Bird-of-paradise Courtship Antics Paid Their Counterpart in a Holiday Dance

Another in a series of spectacular displays of bird life, the "Bird of Paradise" dance, performed by the "Bird of Paradise" dancers, is the most beautiful and most interesting of the "Bird of Paradise" dances. It is the most beautiful and most interesting of the "Bird of Paradise" dances.





New Years Eve in Katsinbung & the Festival of the Sun.

New Years Eve is kept among the Indians of Katsinbung & the festival of the Sun is held on the 1st of the month of the year of the Sun.

The festival of the Sun is held on the 1st of the month of the year of the Sun. It is a festival of the Sun, and is held on the 1st of the month of the year of the Sun. It is a festival of the Sun, and is held on the 1st of the month of the year of the Sun.

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Transformed! Chief
Finds a Cheap Beauty
More Alluring than
Five Paradise Plumes

It is a fundamental principle of the law of the land that every citizen has the right to be heard in his own defense. This right is not only a right of the individual but also a right of the community. The law of the land is the law of the people, and the people have the right to be heard in their own defense. This right is not only a right of the individual but also a right of the community. The law of the land is the law of the people, and the people have the right to be heard in their own defense.

[illegible]

From the 1950s to the 1970s, the U.S. government's policy was to encourage the growth of the private sector and to limit the role of the public sector. This was done through a variety of means, including tax cuts, deregulation, and privatization. The result was a period of rapid economic growth and technological innovation.

Environ Biol Fish (2015) 98:1111–1121

$\Gamma_{\text{max}} = 1.0$ (100%) $\Gamma_{\text{min}} = 0.0$ (0%)
 $\sigma = 1$ (100%) $\sigma_{\text{min}} = 0.0$ (0%) $\sigma_{\text{max}} = 1.0$ (100%)
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Neck Shells Say,
"I'm Ready if You
Want a Wife"

[illegible][illegible]

Further, we have shown that the \mathcal{H}_2 norm of the closed-loop system is bounded by the \mathcal{H}_2 norm of the open-loop system. This is a very useful property, as it allows us to design a controller that stabilizes the system and also minimizes the \mathcal{H}_2 norm of the closed-loop system. This is a very useful property, as it allows us to design a controller that stabilizes the system and also minimizes the \mathcal{H}_2 norm of the closed-loop system.

As a consequence, the firm's management has been forced to look for ways to reduce the firm's operating costs. One way to do this is to reduce the firm's operating expenses. This can be done by reducing the firm's operating expenses in a number of ways. For example, the firm can reduce its operating expenses by reducing its operating expenses in a number of ways. For example, the firm can reduce its operating expenses by reducing its operating expenses in a number of ways.



articulation of his crest plumes, his motions as jittery as a mad wasp.

We went on to locate three display limbs of the Superb Bird of Paradise and to attain it photographs of its dance (page 443). But our days were growing short. One morning a runner broke into camp with news. "Dry-fella master and missie belong em a full down this along cargo ba us along morningtime now." In brief our expedition leader, Armand Dore, and his wife had landed early that morning. They would join us shortly, and we would drop our ornithological survey for the filming of the Stone Age natives around us.

Denis appeared within a few days, and we set out for Katunlag, deep in the Kubor Range. We were, beyond doubt, a cosmopolitan crew—Armand, Michaela, Carmet, Bob Doyle, Kautenthaler, Margaret and I. Father Bodnar, and Father John Nilles, a highly trained anthropologist, often joined us.

We were, in fact, a United Nations on the march, with Czechoslovakia, Belgium, France, Australia, Germany, Switzerland, and the United States represented. For most uses French and English sufficed, but in moments of strain we tended to lapse into pidgin. It can be most expressive.

Chief Boma Holds a Sing-sing

Our goal was an elaborate sing-sing to be held in the realm of a chief named Boma (opposite). The nearer we got to his village, the sounder appeared our news sources, for from the hills around natives were trudging down to the valley, painted and feathered, greased and spruced up for a party.

Chief Boma met us affably. No shrinking violet, he more nearly resembled a walking bird of paradise. We contributed some cloth and cellophane to his costume, and Margaret loaned him No. 1 wife a mirror—which he later shattered, giving the poor woman a couple of black eyes in exchange.

The preliminary daytime dances proved almost as electrifying as the sing-sing itself. From sunup to sundown three days in a row, platoons of natives pounded the dance arena with their feet, led by a chieftain who intoned a restless, repetitious chant which lent a relentless madness of delirium (pages 472 and 481).

All day long the bare feet tramped and shuffled; the red, blue, and gold field of paradise plumes nodded and swayed; the pulsing drumbeats and incessant songs wove a hypnotic spell upon the dancers. Around them crowded spectators—women, girls, children, oldsters—gaping and remarking upon one brave's agility, another's grandeur.

Then came the "long-long"—the crazy man. Dressed with yellow mud and dead grass, he

charged the assemblage like a frantic, twitching, cornered animal. Though he brandished an ax and spear, the children, screaming in delight, followed him in jacks.

The long-long respected neither age nor sex nor status. He attacked all with the same seemingly murderous inclination. Only the stooges who accompanied him appeared able, in the nick of time, to deflect his weapons as he was about to brain or impale some hapless onlooker. His function was to drive away evil spirits so that the coming sing-sing might be fun for everyone.

Meanwhile, the dancers were preparing themselves for the evening performance. Hid in the forest, they spent hours prepping, painting their faces, and inserting their splendid plumes. One man would help another to make up, and, as the final touch, to don his topknot, feathered headdress.

Our own boys came to us with requests for powder paint. This they applied with patience and artistry to the sides of their foreheads, between ear and eye. As we were shortly to realize, each boy intended to transfer this coloring by contact to the corresponding skin area of his "young fella Mary," like ink rolled off a printing pad.

It was 8 in the evening before we filed at last through an excited, jabbering throng into the long, low sing-sing house. Some 20 by 40 feet in size, this hut had along its sides and across its far end a foot-high dais of woven bambooside grass.

Pig Grease Serves as Perfume

The darkness within was lightened somewhat by two small fires. As soon as our eyes had adjusted to the gloom, we saw two young girls kneeling across a narrow aisle, one on either. Now others trooped silently in and took their places beside them, about two feet apart, tucking their string aprons modestly between their legs and sitting as immobile—and as shiny—as carved wooden statues.

In the flickering light they made an entrancing tableau. An occasional girl had a bamboo musical instrument slung from her neck (page 434). Others wore crowns of Lumbi shell, with triangular or diamond-shaped designs in front, while a few sported crowns of cowrie trimmed with golden kapul fat.

Many of the girls had armbands of notched wood, most had arm bands of woven orchid fiber so tight they were more tourniquet than decoration. All, without exception, had topped their toilette with generous applications of treasured pig grease.

Presently, accompanied by a sudden rustling and chattering outside, a line of handsomely decorated men pushed through the hut's small door and circled the U-shaped formation of



and a loud cry behind the person he perceived had fallen.

At that time the young boy with his look of triumph was seen from the other side of the river, but his face was not visible above the water. When the Kalmuck, the whole group of boys ranged themselves in a line.

Some of the boys were seen to be in the midst of a laughing bout. The boy who had fallen is the first to get up and look up the bank. The water remained calm.

Gradually the water rose, and the girls who were laughing were slowly. The chief's partners, bright as their lawns, were never visible with the water's level. The water was calm and the girls were laughing. The chief's partners, bright as their lawns, were never visible with the water's level. The water was calm and the girls were laughing.

Dancing Nose to Nose

It was the nose dancing which appeared to me to be the most interesting. The dancing was done in a line, and the beginning of the song. The first one, who was the first to dance, was seen to be the first to dance. The first one, who was the first to dance, was seen to be the first to dance.



[illegible]

Yet even in the intimacy which the party takes part in, there is no artificiality or affectation, and a certain air of freedom and spontaneity about the proceedings. No one would be able to imagine such a scene in a drawing-room, and when all is over, and each has taken the glass with a pocket watch, as was the custom of the olden times, the guests

There's a contradiction at work between the girls' wealth and their financial distress. It's almost one thing to have money, but in 12th Street you can't pay the salaries and the rent for a warehouse or a factory. There are just no jobs there. They are no work, and any capital would have to be kept in the bank.

For two years after the fire, the company continued to operate. Then, because of the fire, the company was forced to close its doors. The company was forced to close its doors because of the fire. The company was forced to close its doors because of the fire. The company was forced to close its doors because of the fire.

As the number of parameters grows, the number of parameters to be estimated grows exponentially. In order to avoid this, the number of parameters to be estimated is reduced by using a hierarchical structure. The number of parameters to be estimated is reduced by using a hierarchical structure. The number of parameters to be estimated is reduced by using a hierarchical structure.

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Saving Your Bridge From Flood Rovers

The authors are grateful to the referees for their valuable comments and suggestions.

$$\lim_{t \rightarrow \infty} \|x(t)\| = 0 \quad \text{for } x(0) = x_0, \quad \forall x_0 \in \mathbb{R}^n. \quad (7)$$

For the purpose of this study, the following hypotheses were formulated:

1. *Chlorophyll a* and *Chlorophyll b* were determined by the method of Lichtenthaler and Whistler (1973). The total chlorophyll content was determined by the method of Arar and Cook (1980). The carotenoid content was determined by the method of Lichtenthaler and Whistler (1973). The total carotenoid content was determined by the method of Arar and Cook (1980). The total protein content was determined by the method of Lowry et al. (1951). The total lipid content was determined by the method of Bligh and Dyer (1959). The total carbohydrate content was determined by the method of Dubois and Gilles (1950). The total nucleic acid content was determined by the method of Burton (1956). The total ash content was determined by the method of AOAC (1990). The total moisture content was determined by the method of AOAC (1990). The total dry matter content was determined by the method of AOAC (1990). The total organic acid content was determined by the method of AOAC (1990). The total alkaloid content was determined by the method of AOAC (1990). The total saponin content was determined by the method of AOAC (1990). The total tannin content was determined by the method of AOAC (1990). The total flavonoid content was determined by the method of AOAC (1990). The total phenol content was determined by the method of AOAC (1990). The total terpenoid content was determined by the method of AOAC (1990). The total steroid content was determined by the method of AOAC (1990). The total glycoside content was determined by the method of AOAC (1990). The total alkaloid content was determined by the method of AOAC (1990). The total saponin content was determined by the method of AOAC (1990). The total tannin content was determined by the method of AOAC (1990). The total flavonoid content was determined by the method of AOAC (1990). The total phenol content was determined by the method of AOAC (1990). The total terpenoid content was determined by the method of AOAC (1990). The total steroid content was determined by the method of AOAC (1990). The total glycoside content was determined by the method of AOAC (1990).

limits to her bondage, and compensations. Since the courtship period is often long, the girl has some opportunity to see to it that the right man chooses her. If she is not happy after marriage, she can flee her husband and return to her old home, forfeiting only the original bride payment. And polygamy, while it forces her to share her husband, also forces her fellow wives to share the work.

Climax of the dance comes on the last day with a great feast. Pigs, corralled in a special stockade, admired and ogled with much smacking of lips, are now slaughtered by crashing blows on the forehead. Teams of men bleed them, store the inedible fat in gourds for adornment, cut the meat into chunks, and prepare the ground ovens (page 465).

Pork, à la Kubor

These ovens are hollowed from the earth itself or from tree trunks. Stones heated on crills of burning logs are placed at the bottom and interspersed with meat, vegetables, and fragrant leaves. Then water from a bamboo tube, doused on the stones, sends up a head of steam. This is quickly and solidly capped by wet grass, broad leaves, and reeds, converting the oven into a primitive fireless cooker (pages 482, 483). In about an hour and a half the succulent feast is ready.

Distribution of the *pièce de résistance* is far from casual. Where many chiefs have gathered, and hundreds or even thousands of pigs have been barbecued, the first chunks go to the headmen. These pass pieces to their lieutenants, often on the tip of an outthrust spear, and they in turn whip out unbelievably efficient handker knives and carve morsels for their serfs.

The gastronomic orgy may last for days. It sometimes proves fatally wasteful of the tribe's meat reserves. But at least no part of a pig goes unappreciated. Even the entrails are carefully braided and ricked, and the tusks, hoofs, and bones are preserved for decoration. Men keep the scrotums to wear, skewered, from ear and neck, in the curious faith that they act as aphrodisiacs. Women and old men string varicolored piglets together for necklaces.

Hemmed in by the unwhitened hospitality of these Kubor tribesmen, we soon began to feel as if we were attending a college reunion held on a subway at the rush hour. But I made a point of learning as much as I could of the manufacture and the employment of the tool which gives this culture its historic stamp, the stone ax.

I had been impressed before with the speed and ease with which a good stone axman can split casuarina logs, even those a foot or more in diameter (page 468). The thickness of the

blade, I could see, made it possible to strike the log very forcefully without getting it stuck in the wood. But I was unprepared for its sharpness. The blade is razor keen and it holds its edge.

Stone for the best of the work axes is quarried from the Jimmi River and at a spot halfway up the Wahgi Valley toward Mount Hagen. But only the old people seem to know how to fashion them into blades.

Day after day, one of these old-time craftsmen will sit by a puddle of water, grinding the stone upon a big, well-worn sandstone. The blade scrapes forward, turns slightly in the grinder's hand, clicks against the stone, then scrapes back upon its other edge with a hollow, grating sound. It takes almost three months of constant toil to make a good stone ax, and another week to complete a woven stock and handle for it (page 486).

Other stone implements are not common in the Kubors, but they can still be found—clubs, knives, emblems, "money," pestles, mortars, even carved harps. They are clearly the work of another age. Say the natives, "Em belong before; me fellow no savvy."

It is easier for the natives to make the elaborate ceremonial axes, with their flat, slate-like blades of softer, volcanic chert (page 487). It will become easier still for them to acquire the steel ax of the white man as he visits them with increasing frequency.

The Hollow Echo of Prehistory

I thought often of that as we turned back toward Kopy for our outward flight to civilization. Following steep, narrow trails we occasionally crossed a little valley, and from some remote pocket in the hills there would drift down the old, ancestral sound of stone upon stone, the clack and scrape, endlessly repeated, of the axmaker.

I hear it yet in my imagination. But it will not be many years before the source of this frail, fugitive echo will itself be stifled. Then, perhaps, over the whole inhabited globe a music that has been played by primitive man since the dawn of time will resound no more, and in those few of us who heard it last, the memory will fade.

Illustration by
ARTHUR M. S. SMITH

Dancers Flourish a Sacred Shield to Repel the Evil Power of Pigs

Trinidad here associates the ghosts of pigs with the souls of departed relatives. To protect slaughtered persons, the people make green, symbolic wooden shields, and carry them during lutchering in grave yards. Once used, the shields are left to rot in a forest. There the sorcerers' taboos guard them against further use. People believe that if this ritual is not faithfully carried out, their ancestors will return to haunt them.





Beavers Prepare a Feast: River-sharp Handles Knives Near Park

Beavers are preparing a feast for their families and friends. The animals are busy cutting and carving wood, and are also busy with their work. The beavers are also busy with their work. The beavers are also busy with their work.





Water Thruces Hot Rocks; Steam Hisses from a Fiery Cauldron

It is a scene of great beauty and interest, and one that is not to be missed. The water is hot and the steam is thick, and the rocks are red and glowing. The scene is a sight to see and a memory to cherish.

It is a scene of great beauty and interest, and one that is not to be missed. The water is hot and the steam is thick, and the rocks are red and glowing. The scene is a sight to see and a memory to cherish.





Startled Owl Takes Flight; Possum Takes Tail Like a Monkey

Two specimens of the common Barnbrook Wood Owl were seen on the 25th of June. It had not yet started to prey upon its usual food, Canada Kingletailed Possum. The bird was seen to fly from a tree to a branch of a tree, and then to a branch of a tree, and then to a branch of a tree.

Red Gleaner in a Koller's Eye, & the Village Cassowary

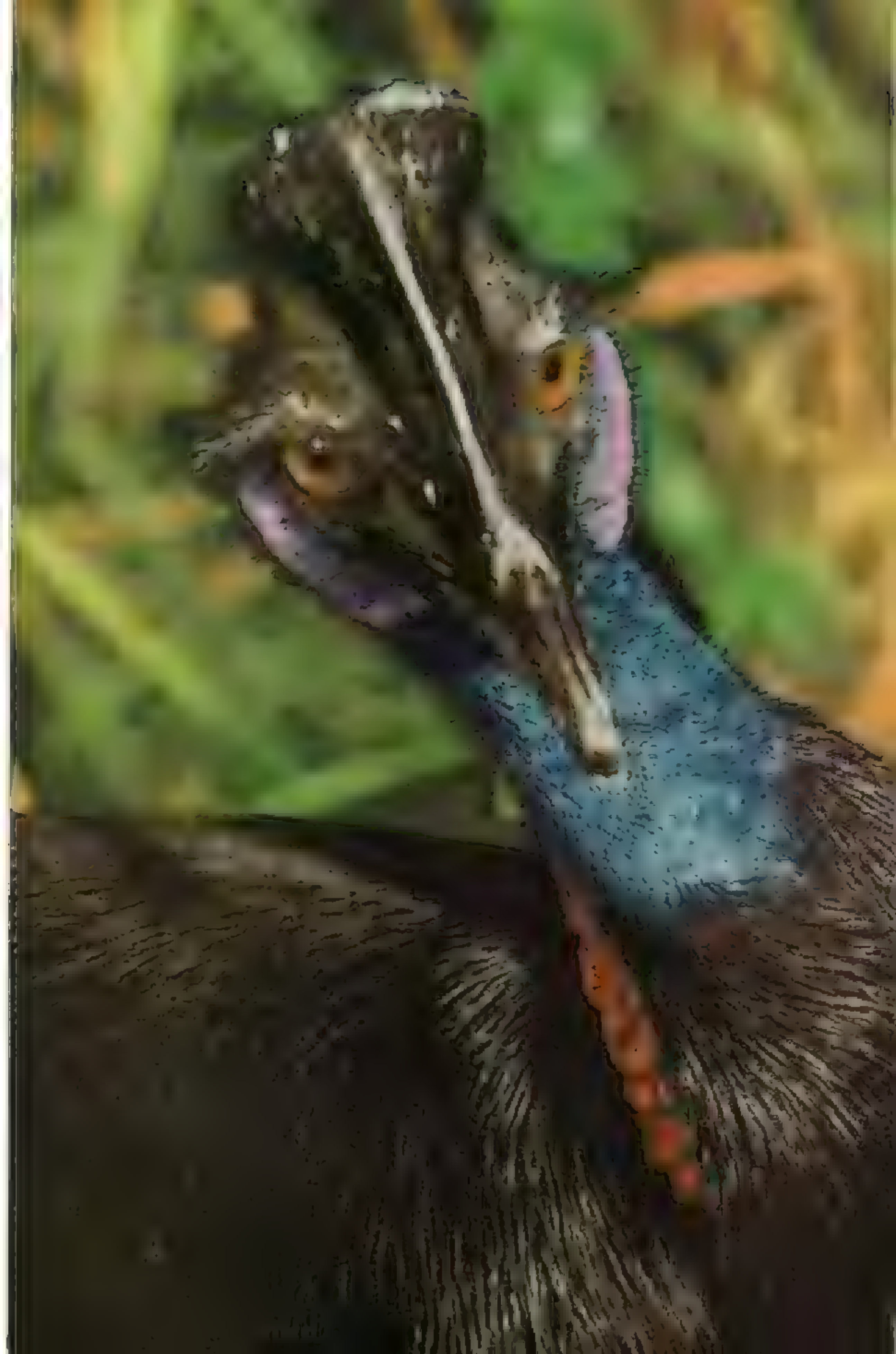
At the village of Koller's Eye, the Red Gleaner was seen to fly from a tree to a branch of a tree, and then to a branch of a tree.

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THE HAWAIIAN

1928

THE HAWAIIAN ISLANDS, OCEANIA, AND THE PACIFIC

Palm Nuts Click Like Castanets When a Warrior Walks or Dances

Long years ago, when we reported from the island of Hawaii that a group of natives were in the habit of "killing" palm nuts, I never thought I should see them in action. The natives of Hawaii are now in the habit of using palm nuts as castanets in their dances.

Man Competes with Parrot in Flamingo Exhibition

perforatus (formerly the Double-headed Parrot) is now in the hands of the Hawaiian Islands. It is a very common bird in the islands. It is a very beautiful bird, and it is very common in the islands. It is a very beautiful bird, and it is very common in the islands. It is a very beautiful bird, and it is very common in the islands.



Three Months on an Arctic Ice Island 499

Flying in a Giant Eagle, U. S. Air Force Scientists Probe
Top of the World Mysteries Within 100 Miles of the Pole

BY JOSEPH O. FLETCHER

Lieutenant Colonel, United States Air Force

HOVER the cold, vast Arctic Ocean the radar officer in a converted B-29 Superfortress, drawing toward the North Pole stared unreluctantly into his scope. There, outlined against the characteristic pattern of the ice pack, was radar's picture of land—an island rising from deep sea where no land should be.

Quickly the airman called the plane commander on the interphone and verified the position as 300 miles north of Point Barrow, Alaska. He sketched the discovery on his chart and marked the date—August 14, 1946.

I think this marked chart and accompanying report, turned in by the 72d Photo Reconnaissance Squadron at Ladd Air Force Base, Fairbanks, Alaska, should rank with the important documents of Arctic exploration.

This young American had not discovered new land, as he believed. But he had provided a key which was to unlock one of the Far North's old mysteries and give his country a valuable base closer to the Pole than men had ever lived in comfort and safety.

For me personally, that key opened the door to a white world of scientific discovery and adventure. I was first commander of America's northernmost outpost, and for a quarter of a year lived 150 miles and less from the very top of the world.

"Land" That Moves with Arctic Winds

After the B-29's return other airmen soared over these northern wastes to confirm the existence of what was now termed "Target X."

They looked down on the sabbid—egg blue of lakes, the steely glint of rushing streams, and a coast 20 to 40 feet high rising from the tumbled sea ice of the polar pack.

Rocks, they reported, jutted from a wind-swept plain. Patches of earth showed darkly. In vain did the pack, destroyer of explorers' ships, attack the island's shores. Giant fragments piled atop coastal cliffs attested the strength of this 200-square-mile mass.

But, mysteriously, it was several miles from where it had first been plotted. There could be only one answer. "Target X" was a drifting island of ice.

"Plover" flights—planes sent out early over the North Pole by Air Weather Service to observe conditions there—were alerted to watch for more ice islands. They found two

other large ones drifting far from land in the central Arctic basin. Canadian flyers later discovered some 40 smaller fragments in the channels of their country's Arctic archipelago.

Gentle parallel swells, or waves of ice, from a few inches to 15 feet high and from 800 to 1,000 feet apart, crossed the islands' relatively flat surfaces. Imperviousness to the pattering of the pack suggested frozen fresh water—harder and stronger than salt ice. Thicknesses of 200 feet or more, 20 times that of the sea ice, were deduced from their height above sea level.

Pearcy's Explorations Give a Clue

Somewhere along an Arctic shore a giant glacier must be spawning these immensities. But where was such a glacier? Narratives of early explorers supplied an important clue.

Lt. Pelham Aulick, member of the British Arctic expedition headed by Sir George Narvik in 1875-6, and Rear Adm. Robert E. Peary 30 years later, had seen a unique ice foot, or shelf, fast to Ellesmere Island's north shore and extending far seaward. This was apparently a glacial remnant, part of the prehistoric ice that once covered Ellesmere and the surrounding sea as an icecap now covers the interior of Greenland (page 494).

A puzzled Peary wrote a description of the shelf that perfectly fits today's ice islands. Later we were to land on Ellesmere ourselves, and, by comparing corings, match islands to the glacial shelf still extending 10 miles to sea in places.

It is thus still true that there are no icebergs in the Arctic Ocean, bergs as we know them in the Atlantic break from "live," moving glaciers when they reach the sea. Arctic ice islands, much older and larger, have split off from the dead Ellesmere shelf. The process must have been rapid since the turn of the century, for Peary described a far more extensive ice foot than now exists—further evidence of a steady warming in the Arctic.

From a geographer's point of view the most interesting result of recent ice island studies is a possible solution to mysteries of "new lands" never seen again after "discovery." Crocker Land, sighted by Peary in 1906 and marked on Arctic maps until 1940, Donald R. MacMillan in 1914 disproved its existence, may well have been an ice island.



Airmen Bundled Against Minus 20 Cold Survey Their Snowbound Demeanor in the Polar Region

[illegible]

Shelton and his colleagues, among the first to carry out the work, also first came to sit and to work outdoors in their native structures and social institutions, but here, as well, in the town of the 1950s, were the problems.

I learned that the American Air Corps had organized a new group. It was called the "Weather Bureau" and it was to be the "Weather Service" of the American Air Corps. I was told that it was to be the "Weather Service" of the American Air Corps.

[illegible]

When P-3 was captured by the T-1 and T-11's, the rest of surface squadron was flying the ring we were really, it

The first of these is the fact that the data are not normally distributed. The second is the fact that the data are not independent. The third is the fact that the data are not stationary. The fourth is the fact that the data are not homogeneous. The fifth is the fact that the data are not symmetric. The sixth is the fact that the data are not unimodal. The seventh is the fact that the data are not smooth. The eighth is the fact that the data are not continuous. The ninth is the fact that the data are not discrete. The tenth is the fact that the data are not binary. The eleventh is the fact that the data are not categorical. The twelfth is the fact that the data are not numerical. The thirteenth is the fact that the data are not textual. The fourteenth is the fact that the data are not graphical. The fifteenth is the fact that the data are not audio. The sixteenth is the fact that the data are not video. The seventeenth is the fact that the data are not multimedia. 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Expeditions kept us at Ladd Field from January and February. Then we flew to Thule, in Greenland, an Air Force base, where the temperature was 20 below zero.

Shooting at Key Future House

(1) March — we began our "project" and set our first record for this month. A pair of 17.5 inches together on a 22-gallon trap set out over the night of 7-8 March 1968. As time goes we will probably find out exactly what size of traps is best for our purpose.

Only a few days after the incident alluded to in the article, the rollers from the same factory were used. We should have noted that the rollers were long and narrow, and that the roller did not engage with the front of the wheel, but ran into the spokes, as was shown in Fig. 1.



Saw and Shovel Build a House of Snow Blocks to Shut Out Icy Winds

Capt. Lewis Echart, Fisher's Island's chief worker, without lumber or nails. With snow walls made by packing ice together, they found rooms in their day. Hard blue glacier ice, wind blown snow, and tarpaulins made roofs. With the snow they found the fuel for the fuel. The snow was the only material in the house in the rear. Snowshoes (pumps) and the snow and the fuel to the house.

Our firsthand view of this enormous slab of glacier majestically grinding its way over the roof of the world gave substance to hours of briefing, discussing, and training. An enthusiastic party returned to Thule. Once more we reviewed our plan.

Clear weather and good light would be essential for the landing. With Maj. Gordon F. Bradburn, who would command the four aircraft we planned to use, I consulted weather forecast and air a manac. On March 19 we would go, just before the spring solstice when the sun would again return to the Arctic from its long winter sojourn in more southerly latitudes.

At 8 o'clock of the appointed morning the four aircraft thundered off the runway into the gray air. We were on our way at last.

Only our C-47 was to land. Two of the three men it would leave on the ice were working

presently. To save weight, Capt. Lewis M. Marion Jr., Bradburn, known to the crew of the 10th Air Rescue Squadron as "Ice-pack Mike" because of his prowess as an Arctic pilot, doubled as second navigator. I was the copilot. Dr. Kaare Rodahl, physician and research physiologist from the Air Force's Arctic Aeromedical Laboratory at La Jolla, had no flying duties.

General Flies as Copilot

Capt. Lewis Echart flew the ship. Characteristically, Maj. Gen. William D. Old, head of the Alaskan Air Command, had decided that he would allow no one under his orders to take risks he would not take himself; he flew with us as copilot.

Two of our two four-engined planes (C-54s), with Capt. Edmund G. Smith at the controls, were to fly ahead. "Smitty," as we called this son of the South, would find T-3, then

guide us to it with high-frequency radio homing devices. We were to set down for gasoline cached earlier on the sea ice near Cape Sheridan, Ellesmere Island. On the way we would fly over Cape Sabine, where 15 members of Maj. Gen. A. W. Greely's Lady Franklin Bay Expedition died in 1894.

High above, the wind blew strong out of the north. Dangling it, we went out very low. Already difficult navigational problems were made worse by clouds and haze blotting out the sun on the horizon. The twilight glow dimmed the stars we might have used for celestial reference. Navigation became mostly dead reckoning.

Island Lost in Arctic Twilight

It surprised no one, but nevertheless added to the mounting tension, when Smith was unable immediately to find T-3. Then, strikingly incongruous in these parts, came an Arkansas drawl in my ear-phones, "Over T-3," said Spratt.

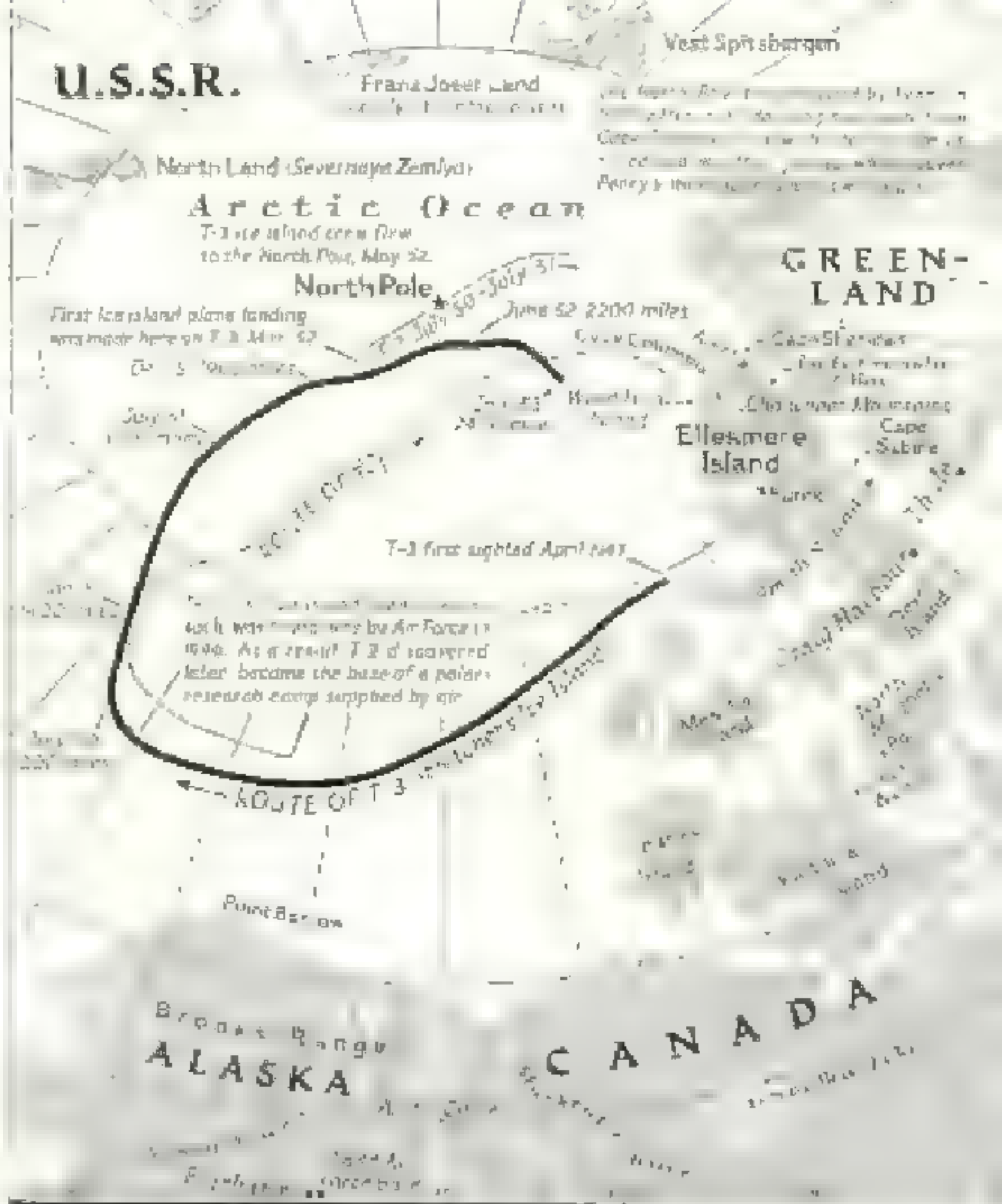
"Good!" broke in Bradburn from the other C-54. "How does it look?"

"Cold," reported Smith, "and there's nobody there."

In less than two hours that lack was remedied, and routinely enough. First, smoke bombs out the door to get wind direction. Next, circles at 300 feet while Ehart picked his spot. Then came the sensation of sudden slowing that showed flaps were down, a few tentative touches with the skis to test the snow, and finally the soft thud of landing.

For a moment after the ship skidded to a stop no one moved, affected by the realization that at last we had reached our objective. Then we piled out in an eager rush.

My first impression was of cold striking with chilling force even though the wind was a mere 10 miles an hour. We estimated the temperature to be minus 50° F. My next reaction was to order us back into the air if our survival appeared doubtful.



Ellesmere Mothers the North's Ghostly Ice Islands

Breaking from Ellesmere's ice shelf, remnant of an ancient glacier (page 244), three huge masses arose a mile in the polar basin since 1947. T-1, the initial discovery, swept a 1,000-mile course, then ran aground off Ellesmere. T-2 directly crossed the Pole. Trailing about two miles a day, T-3 (Fletcher's Ice Island) has backed and filled, carved and pushed along a 2,400-mile path. The only land manned, T-3 saw its first airplane pioneers in 1952. They came from Thule, Air Force base in Greenland.

He looked around and grimly shook his head. "I don't see how anybody could live here. Better get out—if we can," he said.

Following him back along the plane's tracks, I agreed that landing in the snow with heavy aircraft straining equipment would be difficult, but pointed out we had made plans for dropping almost everything by parachute.

"We'd feel awfully bad to leave now," I said to the general.

"How do you know the others want to stay?"

I put into words the anxious looks my companions had given me when we walked off over the snow. "They've already told me."

* Major General Greely, leader of the expedition to the furthest north point reached up to that time, 83° 24', later became one of the founders and a life member of the National Geographic Society.

(1) $\mathcal{A} \subseteq \mathcal{B}$ and $\mathcal{B} \subseteq \mathcal{A}$;
 (2) $\mathcal{A} \subseteq \mathcal{B}$ and $\mathcal{B} \subseteq \mathcal{A}$;
 (3) $\mathcal{A} \subseteq \mathcal{B}$ and $\mathcal{B} \subseteq \mathcal{A}$.

[illegible]

$\frac{1}{2} \left(\frac{1}{2} \right) = \frac{1}{4}$

1. The first part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1) as $t \rightarrow \infty$. It is shown that the solutions of the system (1) are bounded and tend to zero as $t \rightarrow \infty$.

2. The second part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1) as $t \rightarrow 0$. It is shown that the solutions of the system (1) are bounded and tend to zero as $t \rightarrow 0$.

3. The third part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1) as $t \rightarrow \infty$. It is shown that the solutions of the system (1) are bounded and tend to zero as $t \rightarrow \infty$.

4. The fourth part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1) as $t \rightarrow 0$. It is shown that the solutions of the system (1) are bounded and tend to zero as $t \rightarrow 0$.

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6. The sixth part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1) as $t \rightarrow 0$. It is shown that the solutions of the system (1) are bounded and tend to zero as $t \rightarrow 0$.

7. The seventh part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1) as $t \rightarrow \infty$. It is shown that the solutions of the system (1) are bounded and tend to zero as $t \rightarrow \infty$.

8. The eighth part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1) as $t \rightarrow 0$. It is shown that the solutions of the system (1) are bounded and tend to zero as $t \rightarrow 0$.

9. The ninth part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1) as $t \rightarrow \infty$. It is shown that the solutions of the system (1) are bounded and tend to zero as $t \rightarrow \infty$.

10. The tenth part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1) as $t \rightarrow 0$. It is shown that the solutions of the system (1) are bounded and tend to zero as $t \rightarrow 0$.

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[illegible][illegible]

1. The first step is to identify the problem or question that needs to be addressed. This involves understanding the context and the specific requirements of the task.

Table 1

Year	Age	Sex	No.	Ref.
1980	60-70	M	100	[1]
1981	60-70	F	100	[2]
1982	60-70	M	100	[3]
1983	60-70	F	100	[4]
1984	60-70	M	100	[5]
1985	60-70	F	100	[6]
1986	60-70	M	100	[7]
1987	60-70	F	100	[8]
1988	60-70	M	100	[9]
1989	60-70	F	100	[10]
1990	60-70	M	100	[11]
1991	60-70	F	100	[12]
1992	60-70	M	100	[13]
1993	60-70	F	100	[14]
1994	60-70	M	100	[15]
1995	60-70	F	100	[16]
1996	60-70	M	100	[17]
1997	60-70	F	100	[18]
1998	60-70	M	100	[19]
1999	60-70	F	100	[20]
2000	60-70	M	100	[21]
2001	60-70	F	100	[22]
2002	60-70	M	100	[23]
2003	60-70	F	100	[24]
2004	60-70	M	100	[25]
2005	60-70	F	100	[26]
2006	60-70	M	100	[27]
2007	60-70	F	100	[28]
2008	60-70	M	100	[29]
2009	60-70	F	100	[30]
2010	60-70	M	100	[31]
2011	60-70	F	100	[32]
2012	60-70	M	100	[33]
2013	60-70	F	100	[34]
2014	60-70	M	100	[35]
2015	60-70	F	100	[36]
2016	60-70	M	100	[37]
2017	60-70	F	100	[38]
2018	60-70	M	100	[39]
2019	60-70	F	100	[40]
2020	60-70	M	100	[41]
2021	60-70	F	100	[42]
2022	60-70	M	100	[43]
2023	60-70	F	100	[44]
2024	60-70	M	100	[45]
2025	60-70	F	100	[46]
2026	60-70	M	100	[47]
2027	60-70	F	100	[48]
2028	60-70	M	100	[49]
2029	60-70	F	100	[50]
2030	60-70	M	100	[51]
2031	60-70	F	100	[52]
2032	60-70	M	100	[53]
2033	60-70	F	100	[54]
2034	60-70	M	100	[55]
2035	60-70	F	100	[56]
2036	60-70	M	100	[57]
2037	60-70	F	100	[58]
2038	60-70	M	100	[59]
2039	60-70	F	100	[60]
2040	60-70	M	100	[61]
2041	60-70	F	100	[62]
2042	60-70	M	100	[63]
2043	60-70	F	100	[64]
2044	60-70	M	100	[65]
2045	60-70	F	100	[66]
2046	60-70	M	100	[67]
2047	60-70	F	100	[68]
2048	60-70	M	100	[69]
2049	60-70	F	100	[70]
2050	60-70	M	100	[71]
2051	60-70	F	100	[72]
2052	60-70	M	100	[73]
2053	60-70	F	100	[74]
2054	60-70	M	100	[75]
2055	60-70	F	100	[76]
2056	60-70	M	100	[77]
2057	60-70	F	100	[78]
2058	60-70	M	100	[79]
2059	60-70	F	100	[80]
2060	60-70	M	100	[81]
2061	60-70	F	100	[82]
2062	60-70	M	100	[83]
2063	60-70	F	100	[84]
2064	60-70	M	100	[85]
2065	60-70	F	100	[86]
2066	60-70	M	100	[87]
2067	60-70	F	100	[88]
2068	60-70	M	100	[89]
2069	60-70	F	100	[90]
2070	60-70	M	100	[91]
2071	60-70	F	100	[92]
2072	60-70	M	100	[93]
2073	60-70	F	100	[94]
207				

THE UNIVERSITY OF

The Air Force is now in a position to deliver a more powerful message than ever before, with the help of the new television screen. The new television screen is a big improvement over the old one, and it is a big improvement over the old one. The new television screen is a big improvement over the old one, and it is a big improvement over the old one. The new television screen is a big improvement over the old one, and it is a big improvement over the old one.

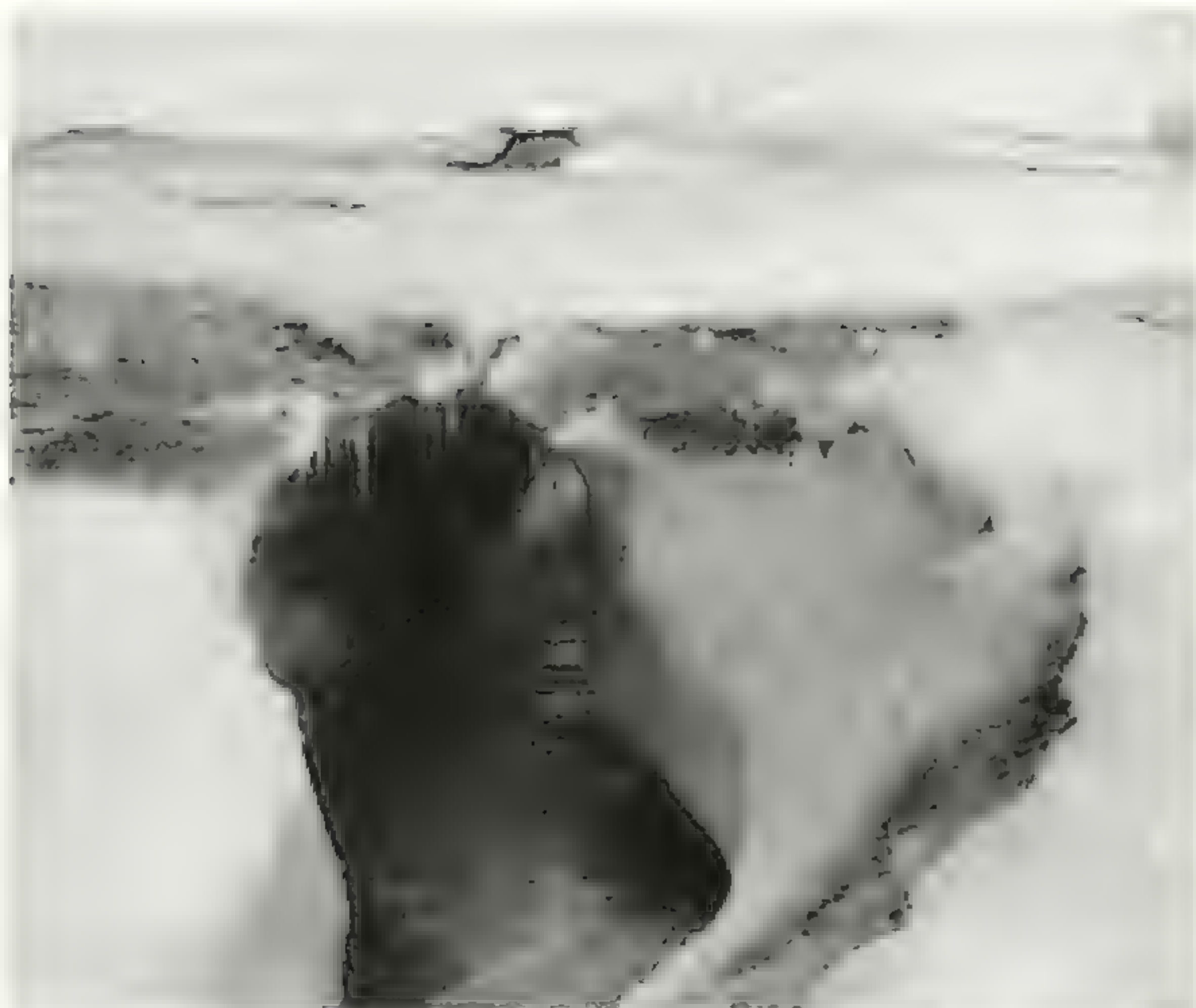
Consequently, the blood cools
off, definitely unless it dried
in a warmer clime. Now Tel
seems to be starting his second
season to see what happens.

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1897

River, Lays, and Boulders Have given the Illusion that Fletcher's Ice Rests on Land

Some of the most striking features of the ice field, as seen from the river, are the large, dark, irregularly shaped objects, which are boulders or pieces of ice, resting on the ground. These objects are scattered across the ice field, and their presence has given the illusion that Fletcher's ice rests on land. The objects are of various sizes, from a few feet to several feet in diameter. They are dark in color, and their surfaces are rough and jagged. The ice field is a light color, and the objects stand out prominently against it. The river is visible in the background, and the sky is a pale blue.



"All right," capitulated the general. "I guess if we had to, we could get you out somehow."

Flares and flares were set out in the snow to mark a drop zone; on the other side of the zone were garbages for the U. S. Army. The planes were parked in a line between the two areas of position. A final go-around it was off, hurtled into the air by four JATO (jet-assisted take off) units. The sound of engines died in the distance. We three were alone.

Knowing that raging arctic gales could strike down without warning, we set about hanging in. Our first shelter was a double-walled mountain tent, regulated government issue with tarpaulin floor. We banked the outside with snow.

Inside, we wriggled into two pieces of sleeping bags, one of which we drew together, ending in a knot at our joints, feet.

Not until then did we start dinner. Like many Arctic travelers before us, we had trouble

lighting the primus stove, partly because of our cold clumsiness and partly because the kerosene fuel showed a tendency to solidify. However, we ate well, and a meal of frozen sausage, potatoes, meat and bread was quite

Yogak, as he, we drifted after dinner into deep sleep, wakened by sharp sounds like the popping of pistol fire, caused by the cracking of ice in the extreme cold. We found that the heating gallery shut down as soon as the weather became a trifle warmer.

Exploration began in earnest the next morning. The first discovery was that the dry snow of sandlike consistency, was a few inches deep over the ridges, three feet in the water troughs. Feet and hands in rubber mitts went through the surface crust, leaving a dense snow. We put on snowshoes.

Carrying rifles and a portable two-way radio, we headed for the sea ice at the edge of the bay. It took us two hours to cover a mile



Frozen Breath Whitens Mustache and Beard

Mr. Milton F. ... of Fletcher's Island ... had ... the ... and ... and ... the ...

with frequent stops to throw frost to their nose and cheeks. This was how we spent our day, north more than when we had landed.

A pilot had appeared before the ... was ... in ... with ... flight, ... the crew that it was well on its way.

Weather Planes Keep in Touch

This and later contacts with "Farm" planes brought us more than official messages. Dr. Rodahl received word from the sky that he had become a father. The ... scientist rummaged in his baggage and came up with the traditional ...

For me in particular, there was something warm in the sight of sturdy ships overhead and the sound of friendly voices on the radio-telephone. I had commanded this fine Arctic flying unit, the 38th Strategic Reconnaissance Squadron (Weather), for the two years

preceding my assignment to Project Icicle, and I knew every man in the squadron.

One of the pilots who regularly looked down on us, Maj. James W. Solerberg, had been my operations officer and my next-door neighbor at Eielson Air Force Base near Fairbanks. Never had I found him wanting; it was good to know he was still near, ready and able to help if help was needed.

As the ship overhead passed on, we continued our first ice island exploration. From the vantage point of a 40-foot ice peak on the shore, we looked out over the pack. It was a wild panorama—grotesque white ridges as far as the eye could see, one large lead of open water in the distance, immense blocks of ice lying in 30-foot-high masses.

"How would you like to drive a dog team over that?" I asked Kaare and Mike, thinking of the indomitable explorers of yesteryear.

"I'll take the airplane," said Rodahl.

Sight of the frigid chaos, in which anything wearing a white fur coat could easily escape detection, brought up the subject of polar bears. Dr. Fridtjof Nansen had met them above 84° N., and some of his companions had been deliberately attacked by a hungry bear.

Dr. Nansen commanded the specially built Norwegian ship *Fram*, purposely frozen into the pack toward the end of the last century. She drifted across the Arctic, becoming the outstanding exception to the rule that ships cannot survive the grip of the pack.

During our stay on the island we never saw a bear, nor a fox, whale, seal, or other living creature larger than a sea bird. But a few days after our first venture afield, we did find large bear tracks and signs of fox close beside our trail. Such evidence is soon drifted over by wind-driven snow.

In the warmer months small translucent shrimp were abundant in leads near the island. Those who manned T-3 after my return to the United States in June found the remains of what appeared to be a lemming, and of fish on the glacial surface after the snow and some six inches of land itself had melted off.

Arctic "Whiteout" Shrouds Island

A pair of caribou horns emerged from the ice one warm day. Possibly the caribou was still frozen below them, but excavation was postponed until the summer of 1953 (page 303).

Many explorations followed the first one. Soon we met the Arctic "whiteout." Write Admiral Peary, describing the conquest of the Pole in the *National Geographic Magazine* for October, 1909:

" . . . we experienced that condition, frequent over these ice fields, of a hazy atmosphere in which the light is equal everywhere.

All relief is destroyed, and it is impossible to see for any distance."

It was an apt description. We found that when thick clouds obscured the sun no shadows were cast to reveal hummocks, drifts, and depressions in the snow. Everywhere there was only whiteness.

We stumbled into drifts and tumbled into holes. In the whiteout, a man out of sight of camp would be hopelessly lost without a compass. Small, dark objects were visible at a surprising distance and often appeared many times their actual size.

Population Jumps Two-thirds

April 1, thirteen days after our landing, was a red-letter day. The C-47 returned, carrying geophysicist Albert P. Crary, of the Air Force Cambridge Research Center, and Capt. Paul L. Green, communications officer. They brought our permanent radio station, the first of the weather and geophysical equipment, and replenishments for the larder.

Camp by now consisted of two 12-foot square tarpaulin-roofed huts of snow blocks and two tents. The second tent became our kitchen, complete with oil stove. One hut was a storeroom. The other, connected to the first by a tunnel, was intended for emergency shelter, but we moved into it bag and baggage the day after the first real storm.

The island acquired a name. Newcomers carried written orders from Alaskan Air Command sending them to "Bletcher's Ice Island." Crary had a neatly lettered sign to go over the door to headquarters.

We said a fond good-bye to Dr. Rodahl and a few days later, with the arrival of Robert D. Cotell and First Lt. Robert R. Donner, we saw Mike Brinegar off. Officially, the scouting party had been replaced with a permanent one—Crary, his assistant Cotell, Green, Donner, and me.

During the next three months we worked long and hard. Many with whom I have talked since my return to the United States were skeptical when I told them we never found time heavy on our hands, were never bored. There was always plenty of work to do; and we never had time to become irritated with one another's constant proximity.

Rare disbelief often greets my assertion that after the first few weeks we were very comfortable. Our supplies—clothing, equipment, food—were the best. Our permanent station had everything we needed.

One of three insulated huts 16 feet square, blown to the island in sections and assembled on hard blue ice scraped clean of snow, became a combined kitchen and assembly room. It had a modern oil range, washing machine with drier, fluorescent lights, electric food



Americans Stand on the North Pole for the Second Time in History

This Air Force party duplicated in a day the feat which cost Arctic explorers months of time. The men flew 700 miles from a Fletcher field station on the coast of Greenland to the North Pole in 10 days. The party, from left to right, consists of: Robert D. Eichel, standing; and Dr. William P. Henshaw, kneeling, who led the party.

mixer, phonograph, and comfortable furniture.

A second hut was sleeping quarters, the third, our all-important laboratory. In it were radio, radio-compass, radio, and geophysical equipment. Captain Green broadcast important weather data every six hours.

Between broadcasts he talked to radio hams all over the world. Offhand I can recall conversations with people in Japan, Scotland and Newbold, Kenya. When conditions were good, amateurs in the United States helped complete telephone calls to our families.

Scientific instruments were calibrated and repaired at a compact workbench in a corner. Instruments within and without the shack measured atmospheric pressure, temperature,

humidity, and wind velocities. We shot the sun regularly for observations of terrestrial position so we could determine the movement of our island and the pack.

Because of the rotation of the earth, our frozen home appeared to drift about 10° to the right of wind direction, and at about 1/45 of the wind's speed. Main cause of the island's movement is wind; consequently it was an erratic traveler, but it averaged one mile a half or two miles a day.

We found no clear trace of sea currents except those induced near the surface by the wind.

The little known Arctic Ocean on which we floated was the special province of Crary and



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U.S. ARMY PHOTOGRAPH

Our Explorers Cross Admiral Perry's Slide Trail on Fieschere Island

After leaving our camp on the west coast of Fieschere Island on June 1, 1900, we made a trail through the snow and ice to the east coast. The trail was marked by a line of stones and was called the "Admiral Perry's Slide Trail." It was a very difficult trail to follow, and we had to be very careful not to fall. The trail was very long, and we had to travel for many hours before we reached the east coast.

The trail was set up by the Americans in 1898, and it was a very good trail. The trail was very long, and we had to travel for many hours before we reached the east coast.

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Schmadinge Grand Canyon Discovered

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Summer Thaw's Bare a Caribou's Antlers. Fletcher's Office Tower above the Ice Pack

Mr. Green, one of the party, is seen in the foreground, looking through a telescope. The background shows the ice pack and the office tower. The scene is a vast, flat, snowy expanse with some small, dark objects scattered across it.

An ice pack, two miles long, was seen in the North Pole. It is a vast, flat, snowy expanse with some small, dark objects scattered across it. The scene is a vast, flat, snowy expanse with some small, dark objects scattered across it.

We took to the ice, and the office tower was seen above the ice pack. The scene is a vast, flat, snowy expanse with some small, dark objects scattered across it. The scene is a vast, flat, snowy expanse with some small, dark objects scattered across it.

In June the temperature on the ice island climbed to freezing and above. Bright blue lakes formed in hollows. Draining them, small

streams rushed pell-mell to the sea, cutting tunnels and miniature canyons (page 49).

Snow-black walls melted but were replaced with empty fuel drums from a steadily growing collection. Small, dark objects lying on the ice sank beneath the surface. Instantly, as reflecting the sun's heat back into the atmosphere, as did the ice on which they lay, they absorbed it. Thus warmed, they melted the ice beneath them and dropped into tin pools of their own making.

This peculiar phenomenon came to our attention by having jokes on visitors. We had found the holes were ice worm burrows. To lend credence to the tale, we froze spaghetti into ice cubes served at table and made giant porcupines to our aghast visitors by our careless flicked inspection.

Late in June came orders for Cotell, Green,

and me to leave. We went reluctantly, replaced by an augmented crew with still more equipment for probing sea, ice, and sky.

As this is written, Fletcher's Ice Island is still inhabited, and valuable work goes on. Ways in which temperatures of ice and atmosphere affect each other are being studied. Gauges set between salt-water ice and island measure the terrific pressure of the pack.

Weather information is most important, and broadcasts continue every six hours. Instruments now go far aloft on balloons. Equipment used to track their course was successfully flown in.

Clues to Mysterious Jet Stream

In Washington, D. C., Air Weather Service meteorologists search reports from Fletcher's Island for clues to the general circulation of the earth's atmosphere. Such information may help to explain the existence of the jet stream, the mysterious, undulating current of air that travels at high speed far above the earth. Knowledge of jet-stream positions often enables airmen to ride tail winds, cutting hours from long trips.

Generally our island home proved itself directionally stable. It had no recognizable bow or stern, of course, but its inhabitants aligned it with true north by means of markers arbitrarily established on the ice.

Twice, for unknown reasons, the island made partial rotations in a clockwise direction, turning the first time through 30° and the second through 80°. These rotations were slow, the 80° turn requiring nearly a month.

A sensitive bubble level, reading to within 1/10 of a second of arc, showed that the island tilted a small, varying amount. This was ascribed primarily to wind, but sometimes the levels were thrown into confusion by localized surface upheavals caused apparently by internal pressures.

Also products of pressures from within the island mass were strange "ice humps." These dome-like protuberances occurred on the tops of ridges near the shores and were occasionally three feet high.

Coring bits were driven down 52 feet. Within this distance 34 distinct layers of dirt were encountered. Mostly mineral matter, they also contained a few bits of twigs and leaves.

The presence of the dirt was accounted for in several ways. Boulders and large earth mounds were terminal moraines left by tongues of glaciers which thrust out on the Ellesmetsjest shelf, then retreated. Summer streams pouring down from the land left silt and small pebbles. Some fine layers may have arrived as atmospheric dust.

The boulders were conspicuous features of the landscape. Some were big, weighing many

tons and measuring as much as 10 feet in diameter. They stood ranged in a rough row, as if a careless giant had tried to build a stone wall. A few of the smaller ones were shipped to the United States for study.

A reliable estimate of the island's thickness was made. Charges of TNT sent shock waves, which travel at known speeds, through the ice. Measuring the elapsed time, Cray and Cotell reported that our camp rested on a 150-foot-thick block of ice, a cold, inert mass as thick as a 14-story building is tall. The figure indicated that the original 200-foot estimate for T-1 might have been a bit high.

To measure movements of the pack with relation to the ice island, our scientists triangulated on several big sea-ice hummocks. One day the most conspicuous of these toppled over with a roar.

A persistent "warm" layer of ocean was discovered 400 feet below the sea's surface. Less than 150 feet thick, it averaged about 2° warmer than the water above and below it. There was no satisfactory explanation for its presence.

Survey parties mapped the island in detail. Early in April the camp began taking its fresh water from two lakes found beneath foot-thick ice. Freezing on all sides forced these water pockets to pressure; when first tapped they spouted in gushers.

Passing sea birds were identified tentatively as gulls and jaegers. Nobody had time for hunting, nor for hiking two miles over the pack to the nearest open water where it might be possible for large marine animals, such as seals and narwhals, to come up for air.

Winter darkness made it necessary to light the landing field, now provided with two runways. A complete portable lighting system was delivered by parachute.

Men Toil Through Long Polar Night

An oceanographer, a marine biologist, and two geophysicists are among the nine men who have toiled ceaselessly through the Arctic's long winter night, adding constantly to our knowledge of one of the least understood regions on earth. Each day has brought a new discovery, a surprise, or a revision of previous beliefs.

The future of the drifting polar base is difficult to predict. It could float off into warmer climes and break up, rejoin Target A back at its birthplace, or make another circuit of the Arctic Basin—possibly many more.

Latest reports indicate that the ice island is beginning a second polar swing—good news for the Air Force, since it would mean another five or six years of useful service for T-3. If it does go around again, many of its former residents would like to go along.

Eyes on the China Coast



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By GEORGE W. LONG

I AM... issuing instructions that the Seventh Fleet no longer be required to shield Communist China.

When President Eisenhower made those words in his first message to Congress, eyes all over the world turned to the coast of China. They focused on Formosa Strait where since the Korean war began, United States Navy vessels had "neutralized" the island refuge of Generalissimo Chiang Kai-shek's Nationalists (page 507).

This Formosa stronghold, shaped like a fried fish, lies 85 miles off China's bulging midriff. Some 9,000,000 people—1,500,000 of them refugees—live on an island smaller than

Connecticut. New Haven, Conn., but having 50 times as many inhabitants.

For 10 years, however, the swarms of Communist boats, packed with young troops, have been landing on the island.

Troops Practice for Invasion

In camps dotted with fighting slugs, they keep at bay maneuvers and basket ball. On the beaches (at shore) they practice landing operations, loading—yet dreading—some day to return to mainland China (page 507).

* See in the NATIONAL GEOGRAPHIC MAGAZINE, February, 1957, "Hot Spot of the 1940's" by Lieutenant G. A. Smith, February, 1957.



'Range, 5,000 Yards!' Shouts a Chinese Antiaircraft Gunner

March 1938—The Chinese antiaircraft gunners are doing a terrific job of shooting down Japanese bombers.

It is not a long time since the whole of China was under the control of the Japanese. But now, thanks to the help of the United States, the Chinese are fighting back. They are fighting back with a vengeance.

The Chinese are fighting back with a vengeance. They are fighting back with a vengeance. They are fighting back with a vengeance.

The Chinese are fighting back with a vengeance. They are fighting back with a vengeance. They are fighting back with a vengeance.

The Chinese are fighting back with a vengeance. They are fighting back with a vengeance. They are fighting back with a vengeance.

—The Chinese are fighting back with a vengeance.

Besides Formosa—called Taiwan by its people—the Nationalists hold the provinces of Chekiang, Anhwei, and Szechwan. They also hold the cities of Shanghai, Hankow, and Canton. They also hold the cities of Shanghai, Hankow, and Canton. They also hold the cities of Shanghai, Hankow, and Canton.

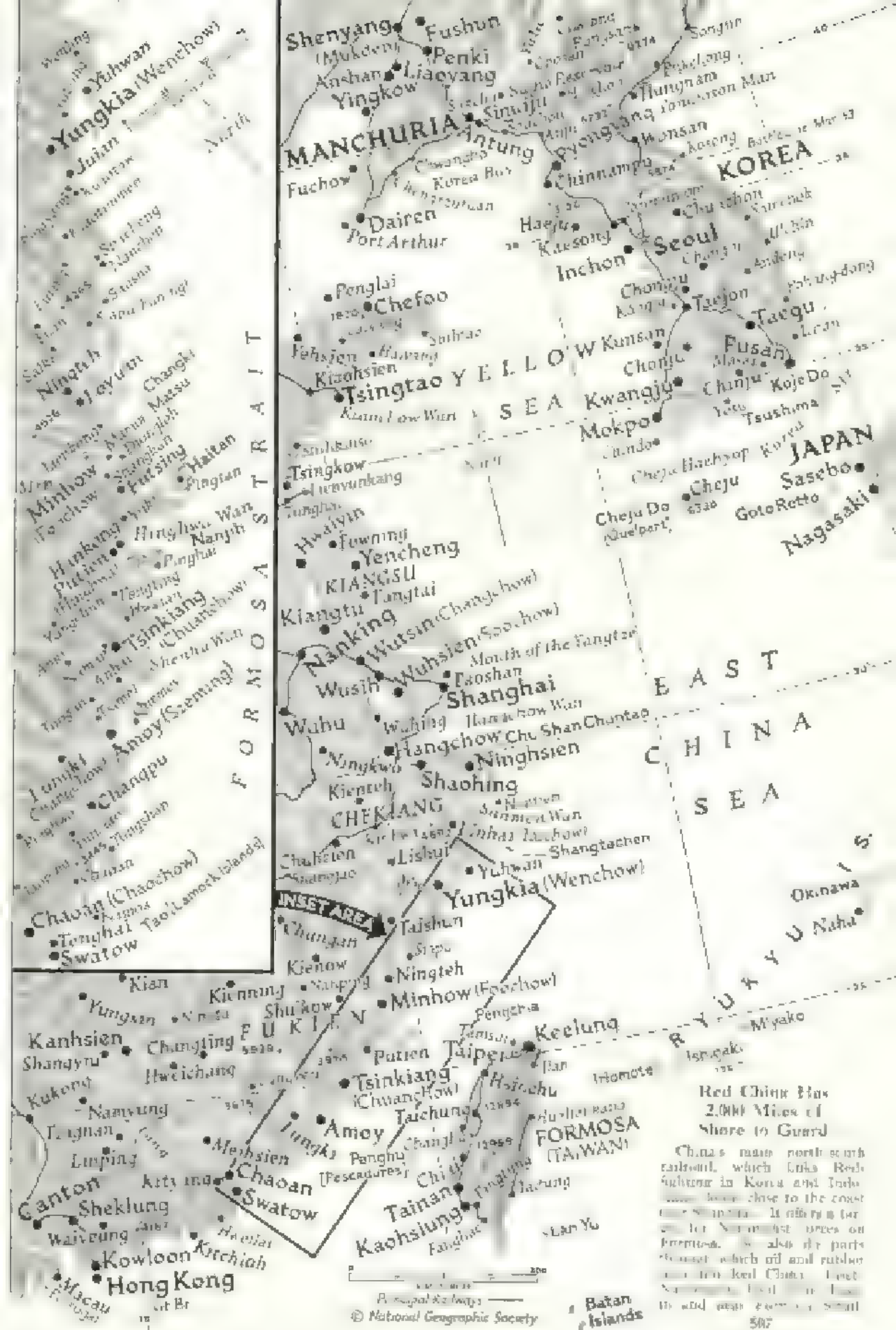
From these bases the Nationalist army is fighting back. They are fighting back with a vengeance. They are fighting back with a vengeance.

The Chinese are fighting back with a vengeance. They are fighting back with a vengeance. They are fighting back with a vengeance.

The Chinese are fighting back with a vengeance. They are fighting back with a vengeance. They are fighting back with a vengeance.

The Chinese are fighting back with a vengeance.





William Lett at Tuller's Tavern

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F115

A black and white photograph of a large, multi-story building with a prominent central tower and many windows, likely a government or institutional structure. The building is surrounded by trees and other structures in the background. The image is oriented vertically on the page.

Army & Navy Engineer Labor Price Water Authority Rates of National Shipbuilding

The following table shows the rates of labor for the construction of ships and other vessels of the Navy and Army, as determined by the War Department and the Navy Department, respectively, for the year 1916. The rates are given in dollars per hour, and are based on the average rates for the year 1915.

The rates for the construction of ships and other vessels of the Navy and Army, as determined by the War Department and the Navy Department, respectively, for the year 1916. The rates are given in dollars per hour, and are based on the average rates for the year 1915.





Nationalist Marines Storm Ashore in a Mock Landing on Formosa

These men are proud of their new marine brigade. When an American advisor makes suggestions, they ask if United States Marines do it that way. "Yes," he says. "Ok," then we do it, too," they reply.

ful, and as brilliant as Chinese jade—the turquoise sea glistening in the sun, steep green hills, azure bays, white beaches, mountains of lazy clouds, and fleets of junks with high sterns and patched orange sails. These myriad junks make elusive blockade-runners.

Hong Kong I found to be bulging and booming. Chinese refugees have trebled its population from 600,000 in 1945 to more than 2,000,000. They crowd every available space and live in shanty towns up hill and down dale.

Ships by the score still anchor in this free port's magnificent, mountain-ringed harbor (p. 509). Products from all over the free world fill store windows. Refugee money, fleeing Shanghai, has built streamlined factories, fostered new industries, raised huge housing developments and skyscrapers.

Walking Miran's narrow, cobbled streets flanked with Old World houses in pastel colors, I imagined myself in a Mediterranean town. Four centuries old, the colony shelters 300,000 on a three-square-mile peninsula. As in Hong Kong, 99 out of every 100 are Chinese. Overshadowed commercially by Hong Kong, the colony has a big fleet of fishing junks, makes firecrackers and matches, and dabbles in international intrigue.

Scattered along the Chinese coast are dozens of famed, once-busy ports.*

Shanghai, cobweb of all China, runs on land built by the muddy Yangtze (page 508). It waxed fat on trade of the Yangtze basin where half of China's 450,000,000 people live. Reports say the Communists have deindustrialized Shanghai, moving many of its factories north and resettling more than a fourth of its 5,000,000 inhabitants.

Opposite Formosa lie Minchow (Fookhow), Amoy, and Swatow, cities built up by trade with the West in the days of clipper ships (pages 510, 511).

Behind the coast facing Formosa, mountains rise 3,000 to 6,000 feet. There roads are poor; no railway reaches the coastal cities and traffic taxes to the sea in junks.

Well inland through most of its length runs China's vital north-south trunk railway, linking armies as far apart as Korea and Indochina. Only in 1951 was it extended to China's southern border.

*See in the NATIONAL GEOGRAPHIC MAGAZINE: The Yangtze, "Landscape Map of the Yangtze, September, 1952." "Along the Yangtze, Main Street of China," March, 1953. "Central China's China," November, 1953. "China's W. Robert Moore.

A Proud Colonial Port, Made Part of Young America's New Capital,
Refused to Be Abolished and Now Sees Its Old Identity Restored

By WILLIAM A. KISSA

WHILE STROLLING on the heights above a town that once flourished for more than half a century ago.

The law was thoroughgoing: it took pains to proscribe not only the town's name, Georgetown, but also the very names of its streets. And the streets had interesting names—Gay Street (two of them), Needwood, Fishing Lane, Cherry Alley, Niagara, West Lane Keys, Wapping.

Southward past our vantage point a broad band of water slipped by in the sun. Trees along its banks wore a mist of faintest green under the first touch of spring.

"This is the River of Swans, *Cohongureton*," said my companion, well versed in local lore. "When the first white men came, the Piscataway Indians told them it was a very old name, the oldest they knew."

Looking down at the river, I could glimpse a small part of a water front where rich confusions of cargo once piled the docks. So much shipping crowded the berths that merchants of those days dreamed of displacing New York as the Nation's foremost port! Only a scow idled in to tie up now.

Not far from the shore some two miles downstream, a swordlike shaft thrust up in sharp white against the sky. We were getting an unusual view of the Washington Monument from venerable Georgetown—40 years old when it assisted at the birth of our Nation's Capitol, of which it forms a part. The River of Swans below us is better known by a later name: Potomac.*

Indians Anchored in Rock Creek

Our vantage point was a remote spot on the far edge of town. A short distance away sheep grazed, and an old vineyard was still cultivated. The pastoral touch seemed a bit unreal to me, for by taxi the White House was less than 10 minutes away.

I left on foot, however, bound for my own house on the opposite side of town. It is hard by the valley of Rock Creek, the steep-sided mount which is Georgetown's eastern boundary. In the golden days the mouth of the creek was a wide, deep estuary where large Indianmen rode at anchor, laden with goods from far ports of the world. Tides surged up the valley for a mile or more.

Today the estuary has shrunk to a small stream. Few tourists who use the parkway snaking along its banks suspect they are driv-

ing on what was once the bottom of a busy bay.

For part of the way my homeward path led along the Georgetown-Bladensburg road, an important link in north-south communications during the Revolution and through the early years of the Republic.

I strayed once to window-shop at Stomhock's saddlery. Gen. George S. Patton, Jr., stopped here just before departing for the north African invasion. He strode in to pick up the belt and holsters he had ordered for his pearl-handled pistols.

The saddlery is on the Falls Street stretch of the old main road, which became Bridge Street as one neared Washington. (After the abolition law of 1895 the prosaic letter "M" replaced both names.) On Bridge Street I passed Stone House, one of the town's few remaining pre-Revolutionary buildings. Tradition says Maj. Pierre L'Enfant, the French engineer who served so ably in the Revolutionary War, had his headquarters here when he was laying out the Federal City (page 532).

To Miss Hullybus's Corner

The true gateways to Georgetown are side streets which lead away from the busy shopping section into sudden and unexpected calm. The houses seemed to doze in the soft weather that day, and my gait slowed before I reached my corner bookstore to stop for a book—and find coffee waiting, too.

This corner of 28th and Q Streets holds a good place in Georgetown lore. It's Miss Hullybus's Corner, although she hasn't been there for a long time. Hullybus was not even her name; it just sounded that way to children. She was Mrs. Gottlieb Hurlbaums, a kindly lady who kept Hurlbaums Bakery and Sweet Shop and made it an institution. There was mourning when it passed shortly before the turn of the century.

I think Miss Hullybus must have left some of her obliging spirit about the premises. That might explain the helpful operations of the Francis Scott Key Book Shop, which occupies them today (page 514).

Books may be purchased there, of course, but the shop seems to devote as much time to extracurricular odd jobs and emergencies. It produces baby sitters when none can be

* See in the NATIONAL GEOGRAPHIC MAGAZINE: "Down the Potomac by Canoe," by Ralph Lind, August, 1934, and "Potomac, River of Destiny," by Albert W. Atwood, July, 1943.



514 *Small business owners in Little Georgetown*

A World Map for a World Business in Little Georgetown

Martha Johnson (left) and Dirk Thompson, owners of Francis Scott Key Book Shop, turn the globe for rare volumes and cater to patrons on six continents. The National Geographic Society's World Map helps them recognize the residents that attract tourists and defense contractors.

Some of the residents of Little Georgetown, an oldish over-wee ends, keeps spate water for a good neighbor gets your shoes to the cobble, and locates owners of lost dogs that stray in. One grateful puddle even sent a bouquet, and another time there was a case of a corn.

When the limits of the District of Columbia were traced in 1791, Georgetown found itself within them as part of Maryland's contribution toward the area, "not exceeding ten miles square," authorized for the Federal City that was to be. This chance circumstance, however, has never kept the town from priding itself on its separate identity.

At first no one could challenge that identity

Founded in 1751, Georgetown was already a mature community by the new Republic's standards. It had a thriving trade, gay social life, and developing culture. Only paper plans existed for tearing a Nation's Capital on the wild, tangled, and swampy lands to the east and south.

A scattering of structures and brick kilns made this uninviting corner in the spring of 1800, when the entire National Government began moving from the temporary capital at Philadelphia. Counting the President, cabinet members, officials, and clerks, the total of Federal employees was fewer than 150.

Georgetown, with a population of 3,000, was not an isolated lawmakers' activity. Scant space in its gazettes; shipping news was more important.

In time—and it took almost a century—the Federal City engulfed Georgetown, and the 57th Congress finally voted it out of official existence on February 11, 1893.

Georgetown, however, kept on being Georgetown.

This perseverance had its eventual reward. Thirty years ago Congress decided the legally nonexistent community had been surviving all along. A new law was approved September 22, 1950, which

redefined its boundaries and set up precautions to preserve its character as a place of historic interest, though keeping it legally still part of the District of Columbia. "Old Georgetown," as the law chose to call it, received the news with calm satisfaction.

Where Tranquillity Waits

Among the first evidences of communal gratification was restoration of old street names. For the benefit of non-residents, our busposts continue to display the designations imposed half a century ago when Congress directed the change of "nomenclature of the streets and avenues of Georgetown to conform to those of Washington."

Some old-school Georgetownians still speak of a trip "into the city" if they leave to shop or visit somewhere in the District of Columbia. The nearest outlying town is rarely more than half a dozen blocks away, but not town is a small town. Its size covers little more than two square miles, its population about 15,000.

For me, then, the city is not foreign. Georgetown is like being transported to a tight little world, cozy and pleasant.

There is a continuity about the narrow, cobbled streets with their uneven sidewalks of red brick. In summer arching trees turn narrow streets into tunnels of green. Old-fashioned corner shops with awnings and doorways with old-fashioned awnings suggest a waiting welcome. Jewel-like iron balconies wrought iron, and historic houses small and great add to the feeling of timelessness.

A visiting architect will find a rich supply of examples of the Federal period to delight in. He may also see things to make him wonder where Victorian, modern, and non-descript styles have with the passing time.

The 1950 law was designed to make the safe-guard the architectural tradition that distinguishes the town. Exterior renovation of new construction now must be approved by the national Commission of Fine Arts.

Owners of shops introduced since the law took effect say their experience is that the plan works. However, the two main business streets, M and Wisconsin Avenue, still have a way to go to catch up with residential areas in restoration work.

More Than a Good Neighbor

My wife and I bought an old home on 35th Street, formerly Washington and Pennsylvania. We were veterans of Washington apartment-living and were not with a house in the suburbs. Our



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Revived, Old Street Names Preserve Georgetown's Identity

At the time the law took effect, the town was in a state of transition. The streets were being widened and repaved, and many of the old buildings were being demolished. The law was designed to make sure that the town's historic character was preserved.

First reaction to Georgetown was what a nice little town we had discovered. We still feel that way.

The first thing we noticed when we moved here was the lack of back yard fences. They were so close to the street that they were almost invisible. The only way to tell where the back yard was was by the fence.

When the owner of a small tailor shop was hospitalized by an accident, a Government official came to be rescued. He got the shop back from the injured woman, then worked before and after his own office hours had laid out finished laundry and dry cleaning to follow customers.

Strangers find themselves speaking to strangers often at length. The day war came



in Korea I received a surprise briefing on conditions there from an engineer just back by air on leave. His job was on a project in the invaders' path. I could have listed all its important equipment when he finished. We had never been into hard—just happened to pick up our newspapers at the same time.

The town's residents offer a goodly variety. Butchers and bakers live here, and I should not be surprised to learn of a candlestick maker. There are families of social prominence, diplomats, legislators, jurists, journalists, writers, and artists. There also are modest households of young men and women striving to get launched on a career, and just "little people," as the saying goes.

One of the happiest men I have ever met was the currier of a small Georgetown parish whose salary was \$150 a year.

When I heard this, I was incredulous. "Oh, I don't need much," he explained. "I have the rectory to live in. I don't require much food, and those bills come out of the church fund. Some of the women come in to cook and clean the house. My clothes seem to last; a new suit or pair of shoes every year or two are about the only major things."

He smiled in his unworldly way. "Perhaps it was a blessing my health made me give up smoking years ago. With prices so high today, I might otherwise have difficulty with my budget."

Maryland Saw Possibilities

Rock of Dunbarton, Rock Creek Plantation, Knave's Disappointment, Beall's Level, Frogland, Discovery, Bet's Prospect, Conjuror's Disappointment, Resurvey on Salop—such were the names of holdings which, in whole or part, went to make up Georgetown.

The site, with its rampart of heights, attracted the attention of a colonizer—Sir John Ninian Beall (pronounced "Bell"). He had commanded Maryland's forces so ably against attacks by Indians that in 1703 the Province rewarded him with a patent of 795 acres on Rock Creek. This he called Rock of Dunbarton (later spelled Dunbarton), perhaps for the great rock above the Clyde in his native land.

Three decades later one George Gordon acquired some 100 acres adjoining Beall's. Other settlers came, most of them Scots, with a few Irish and Germans.

Maryland began to see possibilities in this area, so close to the head of navigation on the river. In 1751 the Assembly at Annapolis authorized purchase of 60 acres for a town "which shall be called by the name of George Town," honoring King George II of Britain.

The 60 acres were bought, at 50 shillings each, from George Gordon and a most reluctant George Beall, the colonel's heir, who

fought to the bitter end. Rapid expansion added almost 82 acres to the town before Washington became President.

The port boomed because it tapped a rich agricultural area. Tobacco for export was almost gold: a single hogshead (1,000 pounds) brought "enough to purchase all the luxuries a family needed in the course of a year," a historian of the era reports. Sister colonies and other parts of the world looked on Georgetown as their flour bin. Lumber, fish, and other goods moved in brisk demand.

Come autumn, F Street often was choked from dawn to dusk with thousands of cattle and sheep from Virginia and large flocks of Maryland turkeys. Some were sold locally; others would be herded along to Baltimore or markets beyond. Heavy-laden Conestoga wagons rumbled to the wharves.

From Silks to Sand and Gravel

I have pored over copies of ships' manifests which conjure up the bustle of those days. Imports are eloquent of a young country's endless needs: silks, satins, laces, shoes, wines, tea, powder for wigs, coal, sugar, soap, tinware. An entry, "One Trunk Hosiery," reminds one that men wore knee breeches then.

Anyone knowing the romance of its past will find today's water front a disillusioning place. Much of it lies in shadow under an elevated motor freeway (page 516).

On Sunday mornings with my dog I have done a bit of nostalgic prowling along the river looking for ghosts where bulking warehouses used to be. Sand, gravel, and cement companies occupy most of the shore. There are a few lumberyards, building supply firms, and a dump for structural steel. A stubby engine shunts freight cars about. Noisy echoes bounce back from the highway overhead.

Few sizable industries exist now, most of them in the water-front section. A flour mill and a cooperage are the only ones reminiscent of the distant past.

Thus it is always reassuring to pass the offices of William Kling & Son, purveyors of coal and firewood to the town for generations. A sign on the brick wall proclaims: "On This Corner Since 1835."

Businesses less than 50 years old here are regarded more or less as newcomers.

The era of full-rigged merchantmen and flourishing commerce may be gone, but Georgetown remains Washington's port of entry, as it was from the start. Our Custom House still collects substantial revenue for the U. S. Treasury. Last year's total was nearly two and three-quarter million dollars.

Collection of duties began soon after the War for Independence. The present Custom

Undue absence from a session or tardiness meant a fine for the offender. That law had teeth in it. Checking on sessions in 1791, I found three of the most important men in town, John Threlkeld, William Deakins, Jr., and Charles Magrader, listed among those penalized for being late. The fine assessed was 78 cents, no trifling amount then or for some years to come. The town's first police force, known as the watch, did not come into existence until the early 1800's, and the men's pay was \$2.80 a week!

Celebrities from Washington to Spatz

Georgetown today is credited with having more listings in *Who's Who* than any other place of comparable size. Illustrious ghosts might add that the town has been associating with famous names for generations and producing its own share of them.

George Washington, a frequent guest, passed this way to his first inauguration.* Earlier, the town watched Braddock's redcoats report for disaster at Fort Duquesne during the French and Indian War, then Lafayette leading troops through for the temerarious with victory at Yorktown in 1781.

Union Tavern, on Bridge Street, long was a favorite with Government officials and celebrated visitors. Congressmen who dwelt there rode to and from Capitol Hill in a special stagecoach drawn by cream-colored horses.

The hostelry sheltered such men as John Adams, Thomas Jefferson, Aaron Burr, Henry Clay, Martin Van Buren, John Marshall, Louis Philippe, Robert Fulton, Talleyrand, Jerome Bonaparte, and Washington Irving. Francis Scott Key stopped there often after taking a house a few blocks away, near the site of the modern bridge that bears his name.

One of the last public functions Washington attended was held in the tavern. Decades later Louisa M. Alcott, author of many novels, nursed Civil War wounded in its bedroom.

Sight-seers should have no trouble locating the northeast corner of Bridge and Washington (M and 30th) Streets, where the inn stood until 1935. A gasoline station has inherited the historic site.

Prominent Georgetownians of the Nation's fledgling years included Dr. William Thornton, architect of the U. S. Capitol,[†] Henry Foxall, whose foundry supplied many of the guns for the War of 1812; Stephen Bloomer Bach and John Carroll, noted clergymen and educators; William W. Corcoran, philanthropist who gave the Capital its Corcoran Gallery of Art; and George Riggs, Corcoran's partner in the banking company which helped restore Europe's shaken faith in the credit of the United States at a critical period in 1848.

This firm was the precursor of Riggs National Bank, now the foremost in Washington.

Many notable names have since been added: U. S. Grant, Robert Todd Lincoln, Alexander Melville Bell (page 535), Gen. Adolphus Greely, Maj. Walter Reed, Julia Marlowe, E. H. Sothern, Mrs. E. D. K. N. Southworth, James Farrestal, Sir Willmott Lewis, and J. R. Hildebrand, beloved Assistant Editor of the NATIONAL GEOGRAPHIC MAGAZINE.

Among well-known residents at the present time are Supreme Court Justice Felix Frankfurter; Senate Majority Leader Robert A. Taft; Massachusetts' John F. Kennedy, youngest member of the Senate, and almost a score of Congressmen; Allen W. Dulles, Director of the Central Intelligence Agency; Dean Acheson, former Secretary of State; Adm. Alan Kirk, Ambassador to Moscow, 1949-1952; Gen. Carl Spaatz, former Chief of Staff of the United States Air Force, and other officers of the armed forces and diplomatic service, both active and retired.

Lost of Trade Brought Dark Days

Georgetown has been called a city of brick. The bricks and exceptionally fine masonry work were major factors in preserving the Federal character of the town during the lean years that befell it. Many factors contributed to the decline but the full impact was not felt until late in the last century.

A fall in the area's water table and the sitting up of the Potomac, due in part to bridge building for Washington, probably marked the beginning. As early as 1807 Georgetown reminded Congress of the gravity of the problem. Another memorial in 1830 complained that \$180,000 of town funds had been spent between 1802 and 1830 for navigational improvements below the Capital and on the town harbor. Adequate aid did not materialize. Larger vessels sought other ports. Trade kept dropping off, however slowly.

The Chesapeake and Ohio Canal, in which the town invested heavily to recoup its big

* See "Travels of George Washington," by William Joseph Showalter, NATIONAL GEOGRAPHIC MAGAZINE, January, 1931.

† See "U. S. Capitol, Cradle of Democracy," by Isabelle Adelman, NATIONAL GEOGRAPHIC MAGAZINE, August, 1953.

Source: *Historical Sketch of Georgetown, D. C.*, by John C. Smith, 1891.

Tiny Homes and Inviting Doorways Lend Charm to Georgetown

Many small houses once used as slave or servant quarters were modernized during the community's recent renaissance. Their narrow facades hide many cozy, snug, and fairly spacious living quarters. Less than 15 feet wide, this restored three-story home is one of the smallest. It was fashioned from the domesticity wane of a house on N Street near 31st.





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THE UNIVERSITY OF CHICAGO PRESS

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**THE LITTLE
SOPHOMORE**

[illegible]



Partner's Love Classic Friends Reflect Students

In a world where
 technology is constantly
 changing, it's important
 to find ways to connect
 and reflect on the past.
 One way to do this is
 through classic friends.
 These are people who
 have been with you
 through thick and thin,
 and who have helped
 you grow and learn.
 They are the people who
 have been there for you
 when you need them
 most, and who have
 helped you become
 the person you are
 today.

A Playtime Attraction For Kids' Students

Fun is a word that
 many kids love to hear.
 It's a word that means
 joy and happiness.
 It's a word that means
 playing and having fun.
 It's a word that means
 being with friends and
 family. It's a word that
 means being happy and
 content. It's a word that
 means being the best
 person you can be.
 It's a word that means
 being a kid.

...







Visitors Stroll the Grounds of Dumbarton Oaks, Headquarters of the United Nations

This beautiful R Street mansion, set amid 45 acres of gardens and trees, dates from 1841. Here Vice President Lyndon B. Johnson left Lafayette during the Mexican American War. The house was built by John D. Dumbarton, a Scottish immigrant who became a successful businessman. The house was later purchased by the United Nations and renamed Dumbarton Oaks. The grounds are a beautiful park with many trees and a large pond. The house is a fine example of Georgian architecture and is a popular tourist attraction.

commercial losses, also proved a disappointment (page 524). Begun in 1828 to funnel more of the goods of a developing hinterland through Georgetown, it was not completed as far as Cumberland, Maryland, until 1850. Floods, financial woes, and reorganizations hampered its progress. Meanwhile the railroad had emerged as an increasingly ominous rival.

This threat did not prevent the canal from entering its best years during the 1870's and 80's, although Georgetown's staunch sympathy for the Confederate cause became a political liability after Appomattox, complicating the town's fortunes. When the panic of 1873 came, it hit the old port hard.

And all the while the city of Washington was steadily growing. In the closing decades of the last century families of wealth and prominence from many parts of the Nation began moving to the Capital to take part in its political and social life. They built magnificent homes on L'Enfant's once-empty avenues and entertained lavishly. Families drifted away from Georgetown for what were becoming more fashionable surroundings.

"Georgetown? Why nobody lives there!" It came to that.

The community deteriorated into a cheap-rent neighborhood. Fine homes became second-class boardinghouses. Neglect and disrepair produced a dilapidated look. Property values hit bottom. For a mere \$8 a month tenants had their choice of many snug brick houses of the Federal period, including the one now my own.

Only a small Old Guard stubbornly held out, hoping against hope that Georgetown would have a rebirth.

Americans Awake to a Heritage

The Wilson administration brought Newton D. Baker to Washington and house-hunting troubles to Mrs. Baker. She almost despaired of finding a place with a yard for her children and thought of trying Fort Myer in Virginia.

"Too bad," sympathized a friend, "you'll have to go through Georgetown."

Instead the Bakers went to Georgetown; the Secretary of War leased a fine old house at 3017 N Street (page 544). That may have been the town's turning point.

After World War I Americans began awakening to the graceful heritage of the country's early architecture. Two influences helped to stir this interest—the opening of the American Wing of the Metropolitan Museum of Art in New York, and the work of John D. Rockefeller, Jr., in restoring Williamsburg, Virginia.*

This was Georgetown's moment. The craftsmen who reared it had built the town to last. It was steeped in history and tradition.

People started buying old houses and re-

storing them, much to the amazement of real-estate men. By 1930 the revival had picked up a momentum which economic stresses and World War II failed to check. Property values did more than perk up. The \$8-a-month houses, restored, brought \$137.50 even with wartime rent control in effect.

Perhaps the most remarkable feature of the whole restoration movement is that it has been financed by private money, raised of it on a family scale. No support came from local business or from a government subsidy.

Old Town Spirit Survives

This may explain the resurgence of the old community spirit. The Georgetown Citizens Association and the Progressive Citizens Association led the fight to preserve the town's character.

When apartment builders threatened invasion during the revival's early days, Georgetownians marshaled such a persuasive case that the District Zoning Commission fixed 40 feet as the maximum height for new structures in residential areas. Next they won their fight to have the town rezoned, so that commercial enterprises are now largely confined to Wisconsin Avenue and M Street, or the water front district. The biggest feather went into the town's cap with enactment of the "Old Georgetown" legislation restoring the town's identity in 1960.

Visitors are often surprised to discover the city of brick is a town of small houses. We have our big show places—Tudor Place (page 542), Sevier Place, Evermay (page 546), Dumbarton Oaks (page 527 and opposite), and other large houses of grand tradition that are architectural gems. But many houses are small, some even tiny.

The narrowest one I know is 2726 P Street. I measured its frontage not long ago. The tape said 8 feet 2 inches. There are others only 9, 10, and 11 feet wide (page 521).

Some are adorned with iron plaques which go back to the days of bucket brigades and amateur firefighters. These fire scars bear the emblems of the first local insurance firms.

Volunteer fire companies controlled such underwriting ventures, and they did not forget the fact in answering alarms. If two houses in a neighborhood caught fire at the same time, the volunteers concentrated on the house bearing the insignia of their company. Any damage claims collected by their insured would affect the firemen's pocketbooks. A noninsured house could wait.

* See, in the NATIONAL GEOGRAPHIC MAGAZINE "Genesis of the Williamsburg Restoration," by John D. Rockefeller, Jr., and "Restoration of Colonial Williamsburg," by A. R. Godwin, April, 1937.

House fronts, particularly the small ones, give no hint that behind them are carefully tended yards, some of doll size, others of more comfortable proportions. I think more effort is lavished on these gardens than on any other plots of soil in the world.

It is estimated the town has 5,000 gardens, as against six swimming pools (page 539). Relatively few gardens are of the large formal class, with expertly trimmed hedges and professionally tended plants. The others are zealous hobbies, and rewarding even when they don't fulfill spring's optimistic expectations.

These garden-backyard combinations are like an extra room, and a favorite place for entertaining (page 538). Since available space is so often the arbiter, most groups are small. Only the big houses have gardens extensive enough for large parties.

Except for working hours, many residents virtually live in their private outdoors a good part of the year. Spring comes early; autumn is usually long and mild. And in sultry, humid summer a shaded yard, however modest in size, is an inviting retreat.

We cite Charles Dickens on our summer advantages. He found Georgetown preferable to Washington's burning heat and "insalubrities." Interestingly enough, the author's great-granddaughter, Morley Dickens, herself a writer, resided here until last year.

College Born with the Constitution

Graceful spires crown the heights above Georgetown. Viscount Bryce, the brilliant British diplomat, wrote of the pleasure he found in admiring them in the sylvan setting he beheld from "modest little N Street," where he had his house. They are the towers of Georgetown University, the country's oldest Catholic institution of higher learning.*

Like the United States, the school was born in 1789, the year the Constitution was inaugurated and Washington became the first President. It was brought to being by Archbishop John Carroll of Baltimore, an intimate of both Washington and Benjamin Franklin.

A prospectus, issued before any students were enrolled, speaks for the spirit of the founder. In a faded copy I read: "The School will be open to Students of every Religious Profession. They, who in this respect differ from the Superintendent of the Academy, will be at liberty to frequent Places of Worship and Instruction appointed by their Parents." This policy has prevailed ever since.

The college made its start with one small building, a few students, and a very limited library. It had an acre and a half of land, purchased from John Threlkeld, the tardy town councilman who was fined (page 520).

For 1953 the university enrollment is 5,000,

representing most States, many foreign countries, and a variety of religions. A quarter-million books crowd its libraries. The campus has expanded to more than 100 acres and there are now 25 buildings. The President, the Very Reverend Edward Bernard Bonn, S.J., administers, in addition to the college, eight graduate schools, astronomical and seismological observatories, a medical center, and a chemomedical research institute.

Before visiting the heights I never suspected how the decision on the college site affected the present face of Washington.

Among locations given consideration was an undeveloped rise of land called Jenkins Hill, three and a half miles away. The idea was discarded because the area was wild and "too far from the city"—Georgetown. L'Enfant later chose Jenkins Hill for the Capitol.

"That has its postscript," a faculty member said with a smile. "We almost had the Capitol on campus, after all."

When Washington was burned in 1814, 'Old North' was the largest structure in the vicinity. It was offered to Congress for a temporary meeting place. To buoy national morale, however, Congress finally thought it best to get along in the least damaged buildings of the burned city.

Old North, the second college building erected, is still in use.

Presidents of the United States, from Washington to Eisenhower, with occasional exceptions, have honored the university by attending commencements, by special visits, or in other ways. Washington set the precedent in 1797 when he rode up from Mount Vernon to Old North and addressed the student body, which included two sons of one of his nephews.

Where Eclipse Hunting Starts

Lafayette was feted on his triumphal visit in 1824. The reception at the college so impressed him that he made special note of it in his speech to the National Assembly upon his return to France. Leading figures from other countries have been received at the university ever since.

The astronomical observatory holds special interest for National Geographic Society members who followed the reports of their Society-sponsored eclipse expeditions to Russia in 1936, to the Laccadive Canton Island in 1937, to Brazil in 1947, and to the Far East in 1948.†

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Washington Through the Years," by Gilbert H. Grosvenor, November, 1901, and "The Nation's Capital," by James Bryce, June, 1913.

† See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Operation Eclipse, 1948," by William A. Kinner, March, 1949; "Eclipse Hunting in Brazil's Rangeland," by F. Burton's Cotton, September, 1947; and "Nature's Most Dramatic Spectacle," by S. A. Mitchell, September, 1947.



eight pages less than the author's count shows.

Anyone interested in Americana will find many reasons to tarry. Here I found General Sherman's shoulder straps, and paper money our town printed in its own name between 1800 and 1860—tobacco-coupon sized notes worth from 12½ cents to a dollar.

The name of William Gaston begins the lengthy list of those who have been students on the heights. Congressman and orator, he was rated the equal of Clay and Webster in debate. North Carolina, his native State, made him its Chief Justice.

"Maryland, My Maryland" came from the pen of another alumnus, James Ryder Randall. Joseph Clark, an early graduate, taught and encouraged Edgar Allan Poe, recognizing him as "a born poet."

Five relatives of George Washington attended the college. The sons of Presidents Van Buren, Tyler, and Johnson are on the rolls, and the adopted son of Jackson. An esteemed Chief Justice of the United States Supreme Court, Edward Douglass White, is only one of the many sons of Georgetown who became distinguished public servants.

Near the university campus is a celebrated institution, the Volta Bureau to promote the teaching of speech to the deaf. First of its kind in the world, the bureau was founded by Alexander Graham Bell, inventor of the telephone and second president of the National Geographic Society.

In its Grecian-style building the bureau houses the world's largest library on deafness. From it, for over 60 years, have sprang many far-flung efforts to help the deaf speak. Along one line of the bureau England modeled its National Institute for the Deaf and Japan revised its method of teaching the deaf.

Last year the bureau's small but dedicated staff answered thousands of letters from 37 foreign countries and the United States. It tells parents how to help their deaf babies talk and how to lead deaf sons and daughters from their silent world into the world of hearing people.

A Romantic Story

The Volta Bureau publishes a monthly review for teachers of speech and persons who are concerned with deafness. Sinclair Lewis was one of its early editors. Honorary President of the organization is Mrs. Calvin Coolidge—a teacher of the deaf before her marriage. Board members include Helen Keller, Mrs. Spencer Tracy, Supreme Court Justice Harold Burton, J. Edgar Hoover, and Dr. Gilbert Grosvenor.

Behind the Volta Bureau is a romantic story. Alexander Graham Bell's wife, deaf at the age of four years, had learned to speak and

read lips with great facility as a child. This she had accomplished with her mother's help at a time when no schools in the United States taught deaf children to speak.

Inspired by his wife's extraordinary achievement and realizing what her success meant to him, Bell determined that "no deaf child in America shall be allowed to grow up mute without earnest and persistent efforts having been made to teach him to speak and read lips."

Across the street from the bureau stands the former home of Alexander Melville Bell, father of the telephone's inventor. Bell senior was himself the inventor of a system of visible speech which was an early aid in teaching the deaf to speak (opposite).

Telephone Aids the Deaf

For 30 years Alexander Graham Bell maintained a laboratory in his father's house, using the part which is now the garage. He called it the Volta Laboratory, for he financed it with France's Volta Prize money which he won in 1880 for inventing the telephone.

In this laboratory he and his associates perfected the graphophone. Few people are aware that the graphophone made the phonograph practicable by replacing short-lived indented cylinders of a yielding material with durable engraved wax records which could be used over and over again. Bell disposed of his patents and gladly used the money to endow the Volta Bureau.

Another university neighbor is the Georgetown Visitation Convent, a girls' boarding school, founded in 1799. Three red brick buildings—the academy, chapel, and monastery—front on the street.

The monastery windows are firmly shuttered from the inside. No curious passer-by may peer in. Those within have no desire to look out. They are cloistered nuns who teach in the academy. There is, of course, a street entrance for the 300 students, who are in high-school or junior-college courses.

So well regarded is this convent, the first established in the infant United States for the higher education of Catholic girls, that there is always a waiting list. One man took no chances on his daughter's admission. A few hours after her birth he wired, "Please send daughter for class of 1964."

The movement to restore Georgetown was still in its early stages when it inherited two community undertakings that have blossomed into annual attractions. They are the garden and house tours, which each spring are a magnet for throngs of visitors.

In 1928 an overburdened charity worker plainly needed a car. Public-spirited women decided to do something about it, and the



Alexander Melville Bell (1819-1905): He invented Visible Speech

[illegible]

idea of a garden pilgrimage was born. The car rolled and the women raised their sights. With their own program advertising, and gifts, the women were and enthusiasm, finally gave them their money. It was the first time. The Neighborhood House had spent in 1915, seven dollars and a half on the garden, and had been much

Here parents with children ages 3 to 10 and their children. Hot lunch is served from 11:30 a.m. to 1:30 p.m., and the program continues with a variety of activities until 4 p.m. Free admission and parking. For more information, call the following evenings for registration and bus purposes:

For some time past the trustees have been engaged in the welfare work at St. John's Episcopal Church. At the eyes of its present pastor, the Reverend William M. Sharp, the church is a real mission to the community, and the trustees are working for the broader objective.

"That goal is to open the door to better living for everyone of the community, regardless of race, color or creed."

Democracy at Work

I have heard it said that Georgetown is a good example of democracy at work. Well, I am sure that the different racial and ethnic groups are often working side by side in a friendly and useful manner.

Deep research through records is required as well as a knowledge of the history and culture of the region. The author's research is based on a combination of these two methods. The author's research is based on a combination of these two methods. The author's research is based on a combination of these two methods.

The English had a look at my house
 where I was preparing the place for the great an-

old note of color as they pass on Sundays, clad in green, red, white, and lavender robes very much like Biblical dress.

The Mount Zion Methodist Church, oldest Negro congregation in the District of Columbia, was founded in 1816 with 125 members. Before the Civil War its membership book frequently recorded opposite a name the single word "sold." It meant the sale of a slave member. After the name of Edward Brown in 1834 appears: "sold—poor fellow."

The More Things Change . . .

One of Georgetown's chief concerns in its early days was to keep the town clean. Residents are equally mindful of the problem today. When the restoration began, it was accompanied by a crusade against trash, refuse, and unsanitary conditions.

Street cleaners are held in proper regard here. I've encountered them at work in the still sleeping streets as early as 6 in the morning. Each year they are guests of honor at a special garden party which includes speeches, lunch, and gratuities. One of the town's leading women is hostess.

Traffic also worried the first officials, apprehensive about the breakneck passage of stagecoaches or horsemen galloping through town. Since M Street is a busy channel for the Capital's populous suburbs in Virginia, the traffic problem is still with us.

In the past few years optimistic pleas have been made for holding motorists to the old surely pace of bygone times, even if it meant stop signs at every intersection. As far as I can learn, such proposals are still tactfully pending.

Some reminders of the past are convenient, even touching.

Negro sawyers used to make their rounds, wagons stacked with logs cut to varying lengths so that scholar would have no trouble getting the right size to fit his fireplace. Sawyers are still part of the scene in late fall and winter. Most wood problems are motorized now, but from time to time I have seen some who rely on the old-style horse-drawn wagon. Like them, the itinerant fishman also believes old dobbie is here to stay awhile.

On Christmas Eve, from colonial times until the Emancipation Proclamation, bands of slaves went through town singing carols in soft, rich voices. They were rewarded with sweetmeats and other gifts.

Despite Georgetown's stretch of lean years,

the custom survived. Negro children still go about the streets singing Christmas hymns and spirituals as only they can sing them.

Georgetown celebrated its 250th anniversary in 1951 with understandable pride, heightened by the still sweet victory of the "Old Georgetown" bill (page 522). A decorous observation it was, nothing to flaunt an older heritage and traditions before the much younger sections of the District of Columbia.

The program provided for a parade, fancy-dress ball, dancing in the streets, concerts, and special church services. Its most imaginative feature was a revival of the fair authorized by the colonial act creating the town, said fair to be held spring and fall as "encouragement to back inhabitants, and others, to bring commodities there to sell and vend."

One pleasant evening after the bicentennial, my wife and I were sitting in the yard with the couple next door, a U. S. Navy commander and his wife, now lost to us by assignment in north Africa. We fell to talking about Georgetown.

I recall observing how many towns there are in this country and the world which have kept one rendezvous with history and are content to bask in the reflection of that moment. Georgetown, it seems to me, has been keeping such appointments for a long time and evidently intends to continue.

The Dumbarton Oaks meeting laying the groundwork for the United Nations might be cited as a recent indication of interest (page 517).

The commander's wife happened to be an Englishwoman, just about to become an American citizen. Perhaps her British background had something to do with the unexpected comment she offered.

"Go It, Old Girl!"

"You know," she said in the clipped manner that always delighted us, "I love it here. The town keeps reminding me more and more of the curtain lines in Laurence Housman's *Litania Regina*. The Queen ascribes how her jubilee procession teared Hyde Park Corner where suddenly a surge of men broke through the lines of police and troops.

"They ran alongside her carriage, cheering and shouting: 'Go it, old girl! You've done it well! Go it.'

"Somehow, you almost get to feel that way about Georgetown."

Members of the National Geographic Society are notified by mail of the date of the next meeting of the Society by the first of the month to affect the following month's issue. For instance, if you desire the address changed for your June number, The Society should be notified of your new address not later than May 1. Be sure to include your postal zone number.



A Onetime Inn Reveals a Stately Hall Not Suggested by Its Plain Exterior

The interior of the Adams Hotel, which is now a part of the historic building, is a fine example of the architecture of the late 19th century. The building is a fine example of the architecture of the late 19th century.





This new car
 Slap has been
 a Rendevooz of
 the Younger Set
 for generations

It is the most
 modern and
 complete of
 all cars. It is
 the only car
 that can be
 driven on the
 road or in the
 city. It is the
 only car that
 can be driven
 in the city or
 on the road.

The Six Ladies
 are waiting for a Place

to sit in the
 car. The car
 is the only
 one that can
 be driven in
 the city or
 on the road.
 It is the most
 modern and
 complete of
 all cars. It is
 the only car
 that can be
 driven on the
 road or in the
 city. It is the
 only car that
 can be driven
 in the city or
 on the road.





THEY HAVE BEEN IN THE
 LINE OF BUSINESS FOR
 OVER 40 YEARS AND ARE
 NOW AT A NEW ADDRESS

1. The first part of the paper discusses the importance of the
 2. of the system. It is a very important part of the system.
 3. The second part of the paper discusses the importance of the
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 8. of the system. It is a very important part of the system.
 9. The fifth part of the paper discusses the importance of the
 10. of the system. It is a very important part of the system.

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Spring Reunited Young Blooms Take the Daisies

Competition for the school children to see the first daisy to bloom in the garden was keen. The first daisy to bloom was the first to bloom in the garden. The first daisy to bloom was the first to bloom in the garden. The first daisy to bloom was the first to bloom in the garden.

100





From Africa to India Men Fight an Ancient Enemy with American Aid;
the Authors Describe Operations in Iraq's Vast Desert

By TONY AND DICKEY CHAPELLÉ

THEKID GILFILLANE, reporting from the forbidding desert of Iraq, we served as war correspondents with one of mankind's oldest armies.

The foe was the migratory grasshopper, the locust of the Bible. For centuries famine has stalked over land after land in the wake of whirling insect hordes. The desert of the Bible "last year yielded in the hills, but there remained not any green thing in the trees, or in the herbs of the field, through all the land of Egypt" (Exodus 10:15).

Loneliest and least honored of legions are the armies of locust fighters. Their banner is a crumpled poison-bran sack. Their weapons move on trucks that every other army has discarded. Their patrols jolt by jeep or rock on camelback across the desert's wastes.

Whole battalions weave casually across national boundaries, occupying and withdrawing overnight. Platoons survive and fight on a goatskin of tepid water. Sentries club the horned snake at the edge of camp, step on the fat scorpion, or drive the desert wolf away with flaring sagebrush fires. Vehicles are overturned and engulfed in fence, blinding sandstorms.

U. S. Planes Join Iraq's Locust Army

In a pink wasteland almost blank on the map, the Iraqi army against invading locusts battles onahand and barefoot under a sun that can suck the life out of a man's throat in half a day. Its first air arm, two small planes bearing United States insignia, learned to navigate across this desolate region by following flag markers, and to use a handful of camo. flung into the air as a wind sock.

A year ago we joined the Iraqi locust fighters at Al Busdya, an advance base 75 trackless miles from cultivated land.

Millions of locusts, hatching in the desert, stretched beyond the country's southern hor-

izon. To the north, ripening grain and dates covered the Mesopotamian valley, traditional site of the Garden of Eden. Every insect killed here in the wasteland would be priceless to ravage these crops.

The use of an organized force to battle the locust is thousands of years old, the idea of meeting the enemy in the desert is only 25. If the men who had that idea were right, the locust scourge may someday be halted for good in wastelands like Iraq's.

In past years the whirring horror had been checked in Iraq but only checked. Some swarms slipped past the army; others hop-scotched in from deep in other nations beyond the reach of defending Iraqi lines.

Airborne Invaders from Africa

The swarms which had sired this generation of half-grown locusts—our immediate enemy—had come from Saudi Arabia and Egypt. They had moved luxuriously along a broad path, just as locusts have done countless times since an unknown craftsman carved the earliest record of their migration, a decoration on an Egyptian tomb of 2400 B. C.

Swarm hordes mark the cross roads of Near East desert & day, then vanishing and their camps warring. (Exodus 10:15) The locusts have been a scourge for over 2,000 years. Some fields are denuded each season; then the year's labor of a whole region may disappear in a day and the price of bread soar beyond the reach of the poor.

The plague's grim timetable includes half the countries of Africa, every Near East nation, and much of South Asia (map, page 546).

Recent invasions have come in late winter from Africa to Arabia, then to Jordan, Israel, and their neighbors, and in March and April to Iraq. In late spring and early summer the wide land belt from Iraq to India is struck, and by August the insect horde has started back whence it came. Every winter campaigns against the locust reach their height in Africa—Somaliland, Kenya, and Ethiopia.

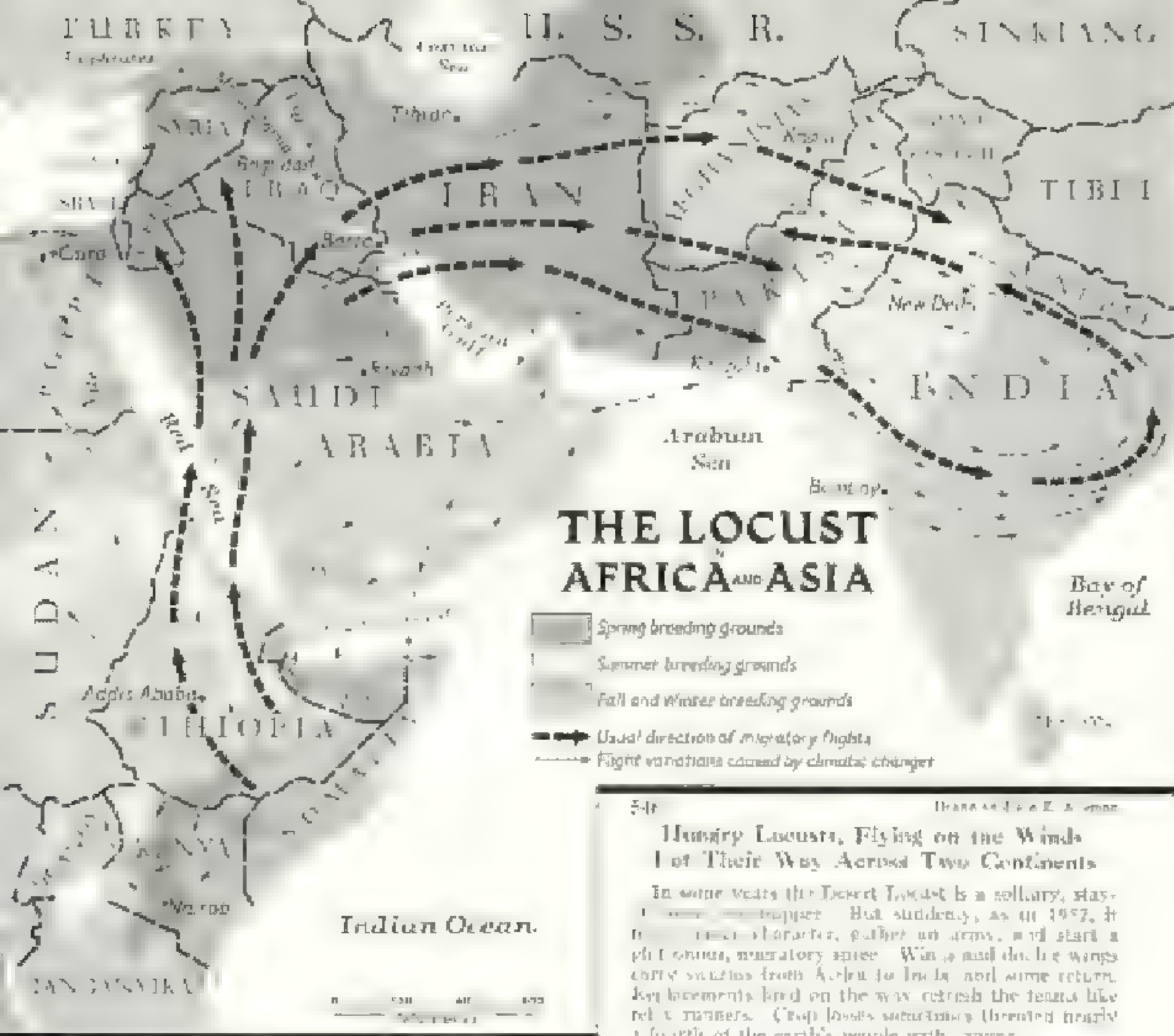
In the worst years the insects leave stark famine behind them. Iraq suffered one of its most devastating invasions in 1943. The first postwar date crop was ripening when the locusts whirled in, like the hordes over Egypt in Biblical times, riding winds off the Persian Gulf.

One day thousands of palms around Basra crouched with their weight of fruit, and grain

Colonial Color in Old Georgetown Makes the Yesteryears Live Again

Ten- and 18th-century costumes blow in on a street ironically renamed S. U. to conform with Washington usage. Gay Street, the former name, gave no stranger his bearings, but it sounded livelier.

Built in 1794, the house on the right is a splendid adaptation of Federal period styles more common in New England. Secretary of War Newton D. Baker made it his home during World War I.



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Illustration by E. A. Brown

Hungry Locusts, Flying on the Winds Lost Their Way Across Two Continents

In some years the Desert Locust is a solitary, stay-at-home creature. But suddenly, as in 1957, it becomes a mass character, gathers an army, and starts a phalanx, migratory spree. Wings and double wings carry swarms from Africa to India, and some return. Key elements bred on the way refresh the teams like relay runners. Crop losses worldwide threatened nearly a fourth of the earth's people with famine.

fields to the north were golden velvet in the hot stillness. The next, locusts came—first a stippling, then a sea of crawling yellow. Their rustling filled all ears and hearts.

When the invaders left, the Basra region looked like a vast battlefield. Date groves showed a forest of bare spars, grainfields were still lie, and even tough, wild marsh reeds had disappeared.

Official reaction to the disaster was prompt. It was then that Iraq's modern locust army was born. Legislators as far away as London and bombed shenks in the stricken zone united to move against the locust.

But once the victims were buried, survivors lost, and political consequences reckoned with, the locust was forgotten except by a handful of entomologists who were to be our hosts in the new crisis of 1957.

During this recent invasion the locust fighters of Iraq, like those in Pakistan and Iran the previous year, began using two new weapons. One was aldrin, an insecticide developed in the United States, so potent that two ounces in a gallon of water or diesel oil will rid an

acre of locusts, the other, small, efficient airplanes which can spray the solution over 100 acres in half an hour.

Supplying planes, pilots, and poison is a project of Point 4, the U. S. program of technical cooperation with foreign countries.

The locust is a headache among governments, and the Iraqi force fighting the invader last year was part of an international army. Much of its intelligence came from British locust experts in Saudi Arabia, Kuwait, and Nairobi in Kenya.

Pakistan cooperated by lending much of the precious aldrin. The poison was flown in from Karachi when it was feared that Iraq's allotment might be delayed in transit.

Winning Allies in Desert and Town

But the addition of American pilots and spraying planes to the 400-man Iraqi force was the most dramatic new alliance.

We soon discovered that the locust fight cuts across race, religion, tribe, wealth, creed, education, position—every consideration except the necessity to kill insects. There is no

Locust Plagues Mix Bread with Insect Poisons and Water and Sow the Seed on a Flopper-Infested Desert

Worms are found in the bread, and the locusts are found in the water. The locusts are found in the water, and the worms are found in the bread. The locusts are found in the water, and the worms are found in the bread. The locusts are found in the water, and the worms are found in the bread.

594





520

Camel-borne Scouts on Patrol Neck Trees Testations in the Hot Dry Sands A Ground Pattern Spreads Here

From the top of the Camel-borne Scouts on Patrol Neck Trees Testations in the Hot Dry Sands A Ground Pattern Spreads Here

AMUSEMENT FOR IRISH BOYS IN THE WHEELHOUSE AT ST. PATRICK'S

A full-length portrait of a young man in a dark suit and white shirt, standing in a room with a large window in the background. The man is looking towards the camera. The room has a wooden floor and a large window with a view of the outdoors.





American Planes Wipe out Iraq Tanks

American planes today are attacking Iraqi supply lines and bases with precision. The planes are attacking the Iraqi army's main supply lines and bases, and are attacking the Iraqi army's main supply lines and bases. The planes are attacking the Iraqi army's main supply lines and bases, and are attacking the Iraqi army's main supply lines and bases.

The planes are attacking the Iraqi army's main supply lines and bases, and are attacking the Iraqi army's main supply lines and bases. The planes are attacking the Iraqi army's main supply lines and bases, and are attacking the Iraqi army's main supply lines and bases.

The planes are attacking the Iraqi army's main supply lines and bases, and are attacking the Iraqi army's main supply lines and bases. The planes are attacking the Iraqi army's main supply lines and bases, and are attacking the Iraqi army's main supply lines and bases.

By the Associated Press
and other sources



A Seed-hopping Plane Descends the Iron Desert with Liquid Mist

[illegible]

revised and used in other work. Further
information on this recognition is in progress.

I can't help it. I want to fight back. I would not need any more time to do a few more, but this is to kill insects.

Leaves are in the chemical

He is one of the few New York officials who took the hardest fight with the black squares.

I distributed it in my city. Six days later I had some more copies made and distributed in my city and I got word back telling them that they had been taken care of.

Now, every local agricultural supervisor is his own best-controlled officer. He is responsible for baiting and poisoning rats. He has authority to hire men to spend the night so he does not need to consider schedules and the cost of rent.

"Under each supervisor we set up a horse trailer with two own leaders, transport, and a guide. I don't have to be a guide myself."

what is needed is far in excess of what we have planned.

We watched much of that planning being done on two worn Arabic maps. One hung in Darwish's Baghdad office. Only the movements of a few towns and batchings were shown, sinister red triangles pointing at the cultivated lands.

Lowest Trucking And Harbor

The other man works in the beef case of Darwish's chief of staff. In a series of plant protection

He is Dima Ahmed, who earned his doctorate and mastered English, which he speaks with a Midwest accent, at Ohio State University (pages 547, 551). On Dima's map, every anti-fascist camp showed us a colored circle. But any student of cartography would have noticed something odd. While he mapped 30-odd fascist control bases, there was no hint of how to get from one to another.

The reason was simple. There were no roads in this 200-mile depth of desert battle-ground. This is not to say there was no transport; Ubba's jeep and 50 supply trucks operated cross-country, using guides, following camel or police-car tracks. The Iraqis call any faint track a *darb*—which is not an expression of opinion but an Arab word for road.

When our Ford 4 pilots, William Schaefer and Keith Anderson, began navigating by these darbs, the term caused much wry humor. There was no humor, however, in one of Ubba's desert rules of the road. The danger of becoming lost was so great that he always required at least two vehicles to travel together.

"And that goes for planes, too," the pilots agreed after their first desert flight.

Ubba's map soon had its face lifted. By kerosene lamp one night he lettered on it the name of each camp in English. The words stood square and uncompromising beside the graceful Arabic script. The pilots were pleased as the names emerged—until they read them: Iwad al Hashash, where the first aerial spraying was done; Khadara al Ma, an advance base for the planes; Qaar Abu Ghar, Samuh, Al Busaiya. . . .

"Something tells me they're not in the atlas my wife has at home," one pilot said to the other with a smile.

Bedouin Guides Lead Patrols

Unwittingly they had touched on an old Bedouin mystery, how one stretch of desert indicating khabala to our eyes from all others can be named, known, and found unerringly by nomad tribesmen who are only confused by a map. The desert war against the locust depends to a large extent on guides who perform this trick again and again.

No nomad, but a Baghdadli, Ubba had to place and oversee a dozen remote camps like Al Busaiya and twice as many in scarcely less isolated areas.

During locust months Ubba lived only to kill the insects. A vastly tolerant and friendly man, he became a different person at sight of a live locust.

On the way to Al Busaiya we followed a trail full of sand traps. Ubba lugged his jeep through perhaps twenty in a row, hitting the edge of each at exactly the speed to skid and rock him through.

But in the center of the next trap he jammed on the brakes, slowing the jeep to a stop to the hub caps. He had glimpsed a field of hoppers and wanted to examine them. Digging out the jeep could wait.

Ubba was host and quartermaster to the U. S. Ford 4 Regional Locust Control Project. Among other things, this involved setting up a traveling mess. He was surprised when the

men appeared to enjoy the diet of fresh chicken, lamb, and boiled rice.

"Why don't you fellows tell me what you really want? I know this isn't what you'd eat at home. Just what would you like?"

The pilots, not wanting to take advantage of Arab hospitality, shrugged. The answer came from the third member of Iraq's anti-locust general staff, entomologist Albert Meymarian.

"Drugstore Coffee" Comes to Iraq

"They'd like 'distwater,' Ubba. Remember the coffee you used to get at the corner drugstore across from the campus?"

That's how American-style coffee came to the locust camps.

Albert had studied at Texas A & M at the same time the director general attended. His feelings about his alma mater are best expressed by the big silver belt buckle he wears in the field. It says in block letters: TEXAS A&M.

Albert is the scientist of the Iraq locust-fighting army.

Would you like to see a sample of locust eggs? They are in a cigarette tin in his shirt pocket.

Or a black locust arrested in its development by a bath of aldrin? He carries specimens of these in a pair of watch crystals that make a transparent case.

Or perhaps a full-grown locust? Albert has a glass tube containing a ye low-winged adult. Sharing it is one of the world's most lethal insects, a scorpion caught outside our tent.

Albert briefed us on our foe, the Desert Locust (*Schistocerca gregaria*, page 558) during an early patrol into the desert, using the "Yellow Peril" as his classmate. The Peril is his jeep, which came, he says, equipped with dual forward sprayer too fast, and I too slow.

"I don't take anything for granted with the locust," Albert shouted from the front seat. "The insect goes through a number of stages, and he's fussy in each of them. Unless the humidity and soil and temperature—even the wind and his food—are right, he doesn't develop at all. But here conditions are too often agreeable. He grows and travels. Locusts have traveled as far as 900 miles in 14 days."

Locusts—Eggs to Winged Hordes

Our own journey was interrupted here by a wait at the single lane pontoon bridge across the Euphrates at the last town on our route, An Nasirya. We waited for a camel loaded with date-palm seedlings; for a herd of fat-tailed sheep; for veiled women carrying water in shiny kerosene cans. Then the white-coated policeman whistled on his whistle, and we moved on.

"First the pest is an egg—short, round, like a pinhead. It is yellowish, and under the microscope looks like a grain. This stage lasts up to 48 hours. Then it is a hopper with three pairs of legs. It is black, flat, and here is the important thing: It can run's legs and crawl.

The second stage it comes with a group, but very small. Then it grows up to a hump. We feed them poison taken with bread and meat by hand. The scientists spray them with diprin-and-water solution."

There a dozen or so professors have been working with us. We sawed down for a camel herd to cross the track. The herder, a robed Bedouin with a shiny turban, rode atop the tallest camel. He tried to guide his beast out of the way, but it had another idea.

In the track the camel halted with a jerk, and the herder slid down its back like a child on a playground slide. A few locusts on the ground were seen to crawl up the camel's leg, and the herder, seeing this, hastily Altered and hurriedly shook his head at him.

It is fine camel riding to show our visitors.

Then he goes back to his subject again. When the first stage comes to an end, it is dark and its two pairs of wings are grown. Later when it is an insect, it is no longer there in the next decade, and the third stage is the most destructive, the third stage when locusts are most numerous, according to him.

"I have never seen an insect like I saw one in 1943, not far from here when I first saw a locust. It was the first locust I saw. I saw the sun from rising. I knew that this was the first locust I saw. I saw a few locusts at first, and then I saw a lot. I saw a locust. Since then we have learned how to do it, but what an awful feeling this way then."



Bedouin Patriarch Seams the Horizon for the Enemy

The patriarch, a Bedouin, is seen at a distance, looking out over the horizon. He is wearing a traditional headscarf and robe. The background is a vast, open landscape under a clear sky.

"There aren't two species of the locust as we are thought—one solitary and the other a ravenous hord. Albeit I should like a mouse. There's only one—our we get it in two phases. The solitary locust becomes a destructive insect when its conditions are right and it multiplies."

Locust Is a Dr. Rebyll Mr. Hyde

The entomologist explained that the locust was a creature that was not normal and that there is a crash-type of quiet almost everywhere. But a locust is a creature that is just the power of the locust and then a handful of grasshoppers can quickly produce a vast progeny. Soil, temperature, rainfall, and a variety of other factors are involved.



This Swarm in Uganda Blotted Out the Sun and the Photographer's Windshield

A typical horde moves on a two-mile front 20 miles or more deep. In 1954, it devastated crops from India to Africa. Locusts blow winds up to eight miles an hour. In 1962, years three species chew up Africa from Cairo almost to Cape Town. Some swarms pause each until trains cannot start.

Locusts hatched under such favorable conditions that it is a total insecticide in metabolism. Even body temperature is higher. Giving up the individualism of their forefathers, they act now as a group.

There is not enough food for the horde when its members begin to grow, of course. They do not battle for what there is, but simply migrate beyond their birthplace, first as nymphs, then flying as their wings develop.

This is the birth of a swarm, and a swarm is self-propagating. In Iraq, for example, there are almost always two generations of locusts moving from south to north during a year of infestation.

But a swarm is created by a single horde, so it often dies at a point of death by mischance—sometimes calmly, but usually only after several years.

Some swarms inexplicably desert the land to sea after veering over a long

feeding areas. Others blunder into cold or are strangled by intense heat. Some end their raiding after a single generation, when their eggs lack the heat to hatch.

Ravenous Swarms Defy Man

But while they live, moving swarms are almost safe from every control device man has tried. No one can tell how big or dense a swarm will be at a given place, or even whether it will come at all. No one can predict how hungry or disdainful of food it will be. A swarm a mile in width, say, might take 10 days to pass through an area, utterly destroying a mile-wide belt and never looking to right or left.

But even if a swarm should remain long enough for us to mobilize our forces, locusts are a tough enemy to destroy. About three inches long, this desert species is impossible to discourage once it has settled to feed, and



"They Shall Fill Thy Houses, and the Houses of All Thy Servants" Exodus 10:6

How many millions of insects have been sent down upon the earth to torment man. These pests represent a host. Never forget that the insects are not only numerous, they are also very hard to kill. They are not only numerous, but they are also very hard to kill. They are not only numerous, but they are also very hard to kill.

from the heart with the quality of a poison small enough to be sent on a breeze, but not so small as to be sent on a breeze.

Scarcely the winged creatures were there, even the most common. The point where the insects were sent down was not a point where the insects were sent down. The point where the insects were sent down was not a point where the insects were sent down.

The making of experiments to control the insects in the ordinary place in places where it might become necessary. In some cases, it is necessary to make experiments to control the insects in the ordinary place in places where it might become necessary.

If we can find out how to control the insects with a long-lasting insecticide, we will be making real progress. This is the first thing to be done. It will kill it. If we can keep out the insects in the ordinary place in places where it might become necessary, we can keep out the insects in the ordinary place in places where it might become necessary.

There was a report in the news in connection with the dream of a man, thousands of years ago.

That I must report. About one hundred years ago, I must report. About one hundred years ago, I must report. About one hundred years ago, I must report.

Caravan in No Man's Land

We are surrounded on our way. We are surrounded on our way. We are surrounded on our way. We are surrounded on our way. We are surrounded on our way.

There the young supervisor was Mohammed Hassan, a funny, black-eyed man with a wide, toothy smile. He was a man of many faces. He was a man of many faces. He was a man of many faces.

Some of the men were in the center of the caravan. Some of the men were in the center of the caravan. Some of the men were in the center of the caravan. Some of the men were in the center of the caravan. Some of the men were in the center of the caravan.

Mohammed Hassan was a man of many faces. He was a man of many faces. He was a man of many faces.



Yellow Skin Meerkat Crossbreeder Gholam Hossein

When I saw him, I was struck by the way he looked at me. He was a man of many faces, and I had never seen him before. He was a man of many faces, and I had never seen him before. He was a man of many faces, and I had never seen him before. He was a man of many faces, and I had never seen him before.

white tents comprising the camp. Though his back flaps he looked at a wide howl of unmarked desert. Through those in front he saw a pile of bean sacks, beyond which in the distance stood the tents of such Arabian nomads. The camp was built on straw matting, one off to one side.

This was a real frontier post, and Mohammed showed us with real frontier hospitality. The veteran Iraqi police chief, too, joined the party. We then sat and talked. He wore his bright star of office above a red head scarf. He was a man of many faces, and I had never seen him before. He was a man of many faces, and I had never seen him before. He was a man of many faces, and I had never seen him before.

As the server finished his rounds, Mohammed looked at me and said, "He is a man of many faces, and I had never seen him before. He is a man of many faces, and I had never seen him before. He is a man of many faces, and I had never seen him before."

one previous. It took him his strongbox. With in American fountain pen he wrote swiftly in flowing Arabic on the other piece, then carried the paper to the near-by police radio transmitter. From the guy wires of the short aerial hung the operator's drying laundry.

Mohammed's message warned fertile areas to the north that Bedouin patrols had just reported a swarm passing 20 miles away.

Mohammed shortly became something of a hero to his American colleagues. They noted his Spartan quarters: a metal cot, thin mattress, and goat-hair blanket; a three-decker table of crate lumber; a wooden chair, the locked strongbox; a pottery water jug with a cotton mesh rag across its mouth as a filter, and two bright goat-hair rugs.

When we asked Mohammed about his adventures at this frontier base, he seemed surprised. "It was quite an ordeal," he said.

Idris suggested that Mohammed might have turned things on a bit. Well, yes, Mohammed allowed, there was such a danger.

The previous week, while he was surveying a hatching area, two armed nomads had ridden up on horseback. They asked what he was doing, and he told them.

Trouble on the Frontier

"If we find out that you are really killing locusts we will shoot you the next time we meet," said one of the nomads. "The locusts are bad for us when there is no rain. Kill them down there, but let our land alone here."

"Perhaps he didn't mean it," Mohammed insisted. "Anyway, I haven't seen him again."

Idris recalled a recent tense visit to a nearby village of tribesmen to arrange for the locust army to work across the border. He was met by a man who said, "We are not sure if we can do this."

technical director of the Point 4 Regional Locust Control Project, sent from the U. S. Department of Agriculture's Bureau of Entomology and Plant Quarantine (page 558).

That Easter morning we had a cheerful breakfast—scrambled eggs hot on a big white platter which had refused to break through 1,200 miles of jeep riding.

Before we were finished, the camp's station wagon ground out into the dunes. Target area for today, located the previous afternoon as we had moved toward Al Busalya, was a long drive away. The station-wagon crew, a supervisor and six workmen, were going out to mark it. Yellow-and-white muslin flags on stubby bamboo poles plumed their vehicle. These they would plant at the corners of infested areas so the planes could see where to spray.

Target for Today

The enemy were young black hoppers, spots on the sand now no larger than a thumbnail, and only a quarter as wide (page 559). They made a shimmering, moving veil across the pink face of the desert, moving in one direction, growing, eating, spreading. Here their diet was wild desert brush. Still wingless they could be killed easily.

Riding out to the scene of action, we were delayed in the first streaks of dawn by a baby camel asleep on the track.

Our animal lay motionless, a bundle of patchy blond fur. Finally, pipestem legs, a twisted neck, and a swinglog tail untangled themselves. The baby lurched awkwardly to his feet and began to amble along, just ahead of our Lumper.

His method of locomotion was spectacularly disorganized. It was as if four legs were too many for a baby camel, and after each step he had to stop to choose carefully which leg he should splay out next.

All over the desert, as our convoy moved, other locust-control convoys were traveling too. We alone had the planes and aldrin, but otherwise our equipment was similar. Except for an occasional police truck, all the traffic in an area as big as North Dakota consisted of locust-fighter transports. Their communications reached back by radio to provincial agricultural offices, and still farther back by telephone to Darwish's sunny office on the Baghdad main street still named for Hamud ibn al-Rabi, caliph of the *Arabian Nights*.

We reached a fork in the track. The pilots, leaving long after we did, had asked us to stop a little past this turning so they could pick the correct fork from aloft. The first of our two jeeps, driven by Dhia and carrying locust fighter Mabee, was already parked.

Soon two specks that were our planes

hammered out of the horizon. Bill feared the flyers would fail to see our desert-stained caravan, and he was right. The specks grew larger, then veered away.

Bill snatched a white head scarf from one of the party and waved it for half a tense moment. The first plane's pilot saw it and came toward us; soon the other followed. Then, to show that they, too, were relieved, they came in low, close behind us.

We must have looked a bit apprehensive until Bill, who knows his planes and men, set us at ease with the right remark.

"Gives one a start," he said, "to see an airplane in the rear-vision mirror signaling to pass."

Ten minutes later we found the first of the four patches of hoppers, its flag markers whipping in the wind. Between the first and second marked fields Bill had selected a strip of gravel to serve as landing area for the planes. We rounded up the ground transport there first, Dhia leaping out of his jeep and shouting that byword of Arab enterprise: "*Fallah!*"—equivalent of "Let's get going!"—to the crew.

Planes Move Against Invaders

Finally, jeeps and trucks stood wheel by wheel along the edge of the improvised airstrip. As the planes made their approach, Bill threw a handful of sand into the air to show them the wind direction. The aircraft settled down together in a double plume of sand.

Huddled in what seemed the middle of the world, the planes and vehicles were the only visible objects more than a few inches high. Casting long shadows in the early sun, they appeared utterly alien.

Before we came, the desert had been alone and quiet. Now the grinding vehicles, taxiing planes, and human beings seemed more than life-size, despoiling something untouched for centuries. Even the splash of water as the aldrin solution was mixed sounded loud and out of place.

Bill Mabee did the mixing himself, 10 tins of water measured with an old kerosene can, and half of a smaller measure of pungent aldrin. As Dhia watched Bill, his hands dripping, climb on a barrel to reach the high mouth of a plane's tank he said: "It is no wonder I and he makes us all ashamed."

Each plane took four loads of lethal solution that morning. Each shuttled across the horizon spraying between the flags for more than an hour (pages 552, 553). The ground crew, many of whom were farmers from the cultivated area, men with no more academic interest in locust control, stood in an approving row watching from the landing strip.

"See," said the driver of a truck, "he never



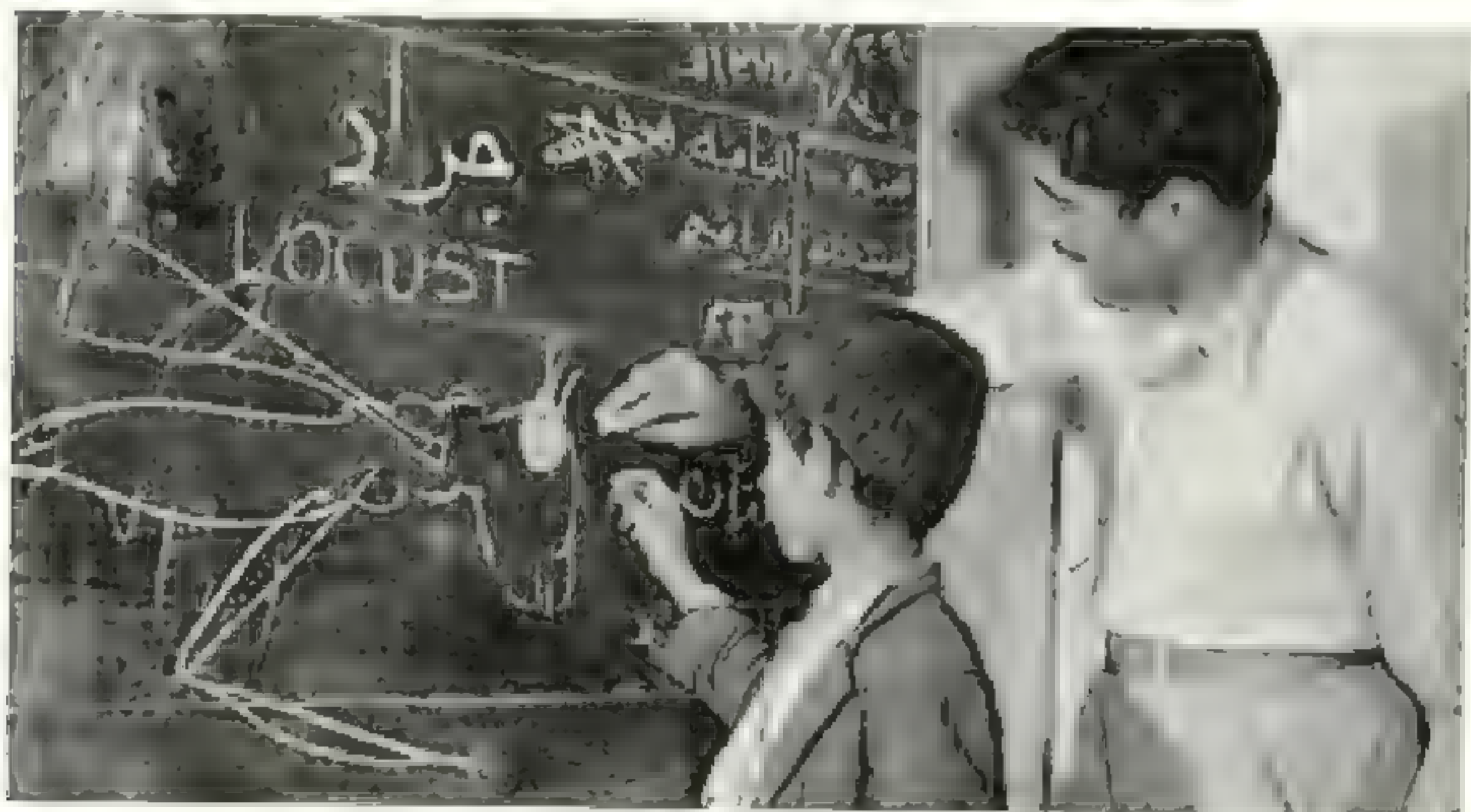
501

8 An Iraqi Class Trains Locust Scouts

Locust scouts are being trained in the use of the new type of locust trap. The scouts are being trained by a class of Iraqi students. A class of Iraqi students is being trained in the use of the new type of locust trap.

9 Backbones Check Outlines the Enemy

A report on the enemy's movements. The enemy's movements are being checked by the Backbones. The Backbones are checking the enemy's movements.



misses. He starts this time on the row right next to the last one he sprayed. I thought maybe he would forget a row, but no, he covers every one as thoroughly as we could on the ground."

This tribute was for Schaefer, finishing the field of hoppers nearest the trucks.

We drove over to get a big's-eye view. Because the planes were working from such a low altitude, we parked the jeep well away from the flags and walked in to lie flat on our stomachs at the edge of the marked area, steadying our cameras with elbows braced in the sand. We intended to stay away from among the hoppers, but they had spilled over the boundaries in the hour since the flags were placed. Before we knew it, Dhia had moved the flags back, and we were 30 yards inside the target area.

Schaefer had started his next run in our direction with only a slit of sky showing under his wheels. It was no time to stand erect.

It seemed impossible that the fast-approaching plane did not intend to land on us. Quickly it grew too big for the camera finder, too big for the eye. Then we were overwhelmed. The noise was deafening; we shoved our faces in the sand and plugged our ears with our fingers.

Caught in a Reeking Rain of Poison

The reeking poison fell, a fine, drenching mist hardly visible but feeling like a slap from a wet dishcloth. Slowly we got up, hair and clothing resistant, droplets in our ears and on our glasses and camera lens.

Before we could exchange words of sympathy Schaefer was back from the other direction—another flop, another picture, another aldrin bath. Then, napping ourselves, we jumped back to the landing strip, picking dying black hoppers off one another.

From the strip, spraying looked extremely dangerous. Almost from the first take-off the wind had buffeted the planes with strong, fitful gusts. This is the most feared hazard of the crop-dusting pilot, and the strain began to show on the fliers' faces as they reloaded their tanks.

After the first run pilot Anderson took his shirt off, perspiration dripping from his chin. After the second, Bill Maher stood beside the biggest truck, sucking a cold pipe and squinting minute after minute at the skimming planes.

"I don't like this. It's not good to spray in this wind. It's like waiting for—waiting for—something," he finished lamely.

The burden of waiting for the planes to return grew heavier. Even the crewmen were silent as time and again a plane seemed to lift the ground. When the wind rose, the

plane steadied itself at 10 feet. Suddenly the wind would drop, and the sound of the engine being gunned as the plane lost precious altitude would reach us. The roar always seemed too late.

We were thankful when the job was done; no one could have borne another trip. Both pilots were soaked with perspiration now, and they tried before they took off for the base to explain their nervousness.

"It's So Easy to Crack Up"

"It's that wind," one said, as though the rest of us had been unaware of it. "In weather like this, the plane gets bounced up. When you try to put her nose down again it's so easy to crack up, if you put it too low."

By the time we reassembled at camp the wind had become a gale. Now we were enfolded in a muffled world of whirling sand. When the sun chose to shine again, trucks and planes would roar out to kill more locusts. But not today.

In Iraq's Parliament or our Congress in Washington, D.C., sheiks and senators might inquire into the worth and meaning of international cooperation to increase the world's living standard. There it may be hard to define 'Point 4 Mission.' Here it is so easy.

Here, Point 4 is men from two nations squatting around a lamp, planning campaigns against invading insect hordes on a bilingual map. It is men working long hours in remote wastes to conquer one of man's oldest scourges. It is pilots risking their lives to help prevent famine.

Point 4 is an American flier saying, "Let's see, Bill. You say the hoppers on one acre will grow up to eat the food on 200 acres. We sprayed 200 acres this morning. That means we've saved 40,000 acres up north."

New Hope for Victory

Point 4 is the Iraqi entomologist with a locust specimen in his palm, its forelegs curled about a finger, saying, "I checked the field you sprayed yesterday, Schaefer. Every hopper is dead."

It is Bill Maher, sitting like a Bedouin with boots tucked under his haunches, fiddling his belt buckle, souvenir from a grasshopper campaign in Nevada, and musing over the map:

"If this wind changes, they'll come back again, and there'll be trouble in Afghanistan, too. I wonder how many people know we could send them our trucks and tanks to do this. Dhia—stop them for good."

And Point 4 is pilot Schaefer, looking up from the letter he is writing to his wife and sons and saying casually, "I thought we were out here to help keep people from starving. I'm hungry—isn't it chow time?"

The Society's Hubbard Medal Awarded to Commander MacMillan



563

FOR outstanding Arctic explorations from 1898 to 1902 and for valuable services in geographic education and science, the National Geographic Society has awarded its highest honor, the Hubbard Medal, to Joseph Foster MacMillan, Commander, United States Navy, Rear Admiral.

The presentation was made by Dr. Gilbert Grosvenor, President of the National Geographic Society and Editor of its Magazine, at a reception held, Washington, D. C., on January 1, 1913. More than 4,000 members and friends of the National Geographic Society witnessed the ceremony, which was held in the main hall of the National Academy of Sciences and continued by the presentation of the medal.

Starting the ceremony, Commander MacMillan received the medal from Dr. Grosvenor, who was also present, with Mrs. MacMillan, who has participated in each of his far-reaching voyages and passed his numerous Arctic explorations as voyager, geologist, and biologist. Evelyn Paul, U. S. N., an ensign and former Navy Lieutenant Eugene F. McDonald, Jr., both played important parts in the U. S. National Geographic Society, United States Navy, Mac-

Millan Arctic Expedition, the first to explore the Arctic coast and sea with a motor.

Exceeding good of this expedition as commander of the ship, its members gave the best of the expedition, held over the North Pole the following year.

Mr. McDonald, now resident of the North Pole, Commander, was MacMillan's second in command and his chief of the expedition.

44 Years of Exploring

In presenting the medal Dr. Grosvenor pointed out that Commander MacMillan's achievement, some of the Arctic land has been conquering and conquering for 44 years.

Commander MacMillan, a member of the U. S. Navy, who has been in the Arctic for 44 years, has been in the Arctic for 44 years, has been in the Arctic for 44 years.

Dr. Grosvenor, who was in the Arctic for 44 years, has been in the Arctic for 44 years, has been in the Arctic for 44 years.

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ORGANIZED FOR THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE

The National Geographic Society was organized in 1888 for the purpose of increasing and diffusing geographic knowledge among the people of the United States and the world. It has since that time been engaged in a variety of activities, including the publication of the National Geographic Magazine, the organization of expeditions, the collection of specimens, and the establishment of museums. The Society has also been instrumental in the development of the National Geographic Society's Research and Exploration Fund, which has supported a wide range of scientific and geographic research.

The Society's activities have been carried out in a variety of ways. It has published the National Geographic Magazine, which is one of the most widely read and respected scientific and geographic journals in the world. It has also organized a number of expeditions, including the famous Peary Expedition to the North Pole in 1897-1898. The Society has also been instrumental in the collection of specimens, including the famous Peary Expedition to the North Pole in 1897-1898. The Society has also been instrumental in the establishment of museums, including the National Geographic Society's Museum of Natural History in Washington, D. C.

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There is a third, and last, way in which we can understand the relationship between the two. In the second half of the century, the two countries have been engaged in a process of mutual convergence, particularly in the public sector. The convergence has been particularly marked in the case of the public sector, where the two countries have been converging towards a common level of public expenditure. This convergence has been particularly marked in the case of the public sector, where the two countries have been converging towards a common level of public expenditure. This convergence has been particularly marked in the case of the public sector, where the two countries have been converging towards a common level of public expenditure.

2. The first two conditions are satisfied by the following two cases:

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It is possible that the high level of support for the 1994-1995 budget is due to the fact that the budget was approved by the House of Representatives in 1994, and the Senate in 1995, and the President signed it in 1995.

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1. The Bank shall have the right to require the Employer to provide a security bond for the full amount of the Bank's obligations to the Employer.

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HOW A HUNDRED YEARS AND A BILLION AND A HALF DOLLARS HAVE



Levi P. Mortimer

The New York Times
April 12, 1902
Page 10

The first Home Insurance Company a hundred years ago faced an unproved market, no precedents, no established opportunities. The company that Levi Mortimer was to manage was to be a pioneer in a new field of business, and had to grow from a single point—New York City. In the field of endeavor, the service was to be personal—and always the demands on the strength of property and insurance were greater. They did a big job and did it well, these early Home agents. On the foundation they laid, and in the spirit of service they created, the Home Insurance Company of the second century will find its chance.



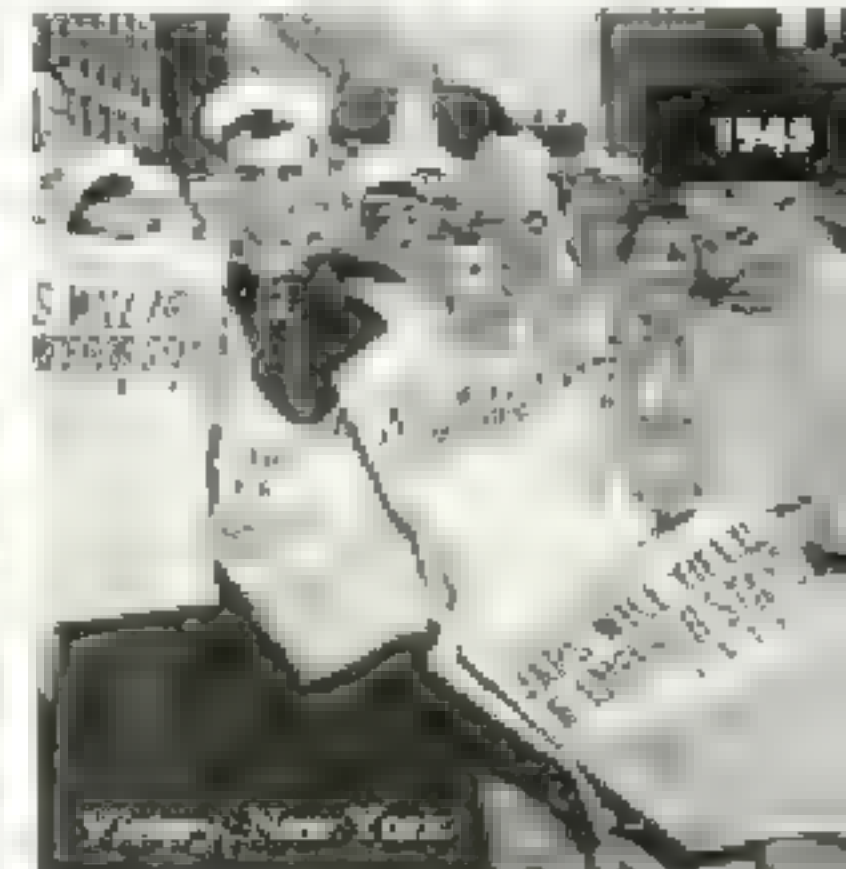
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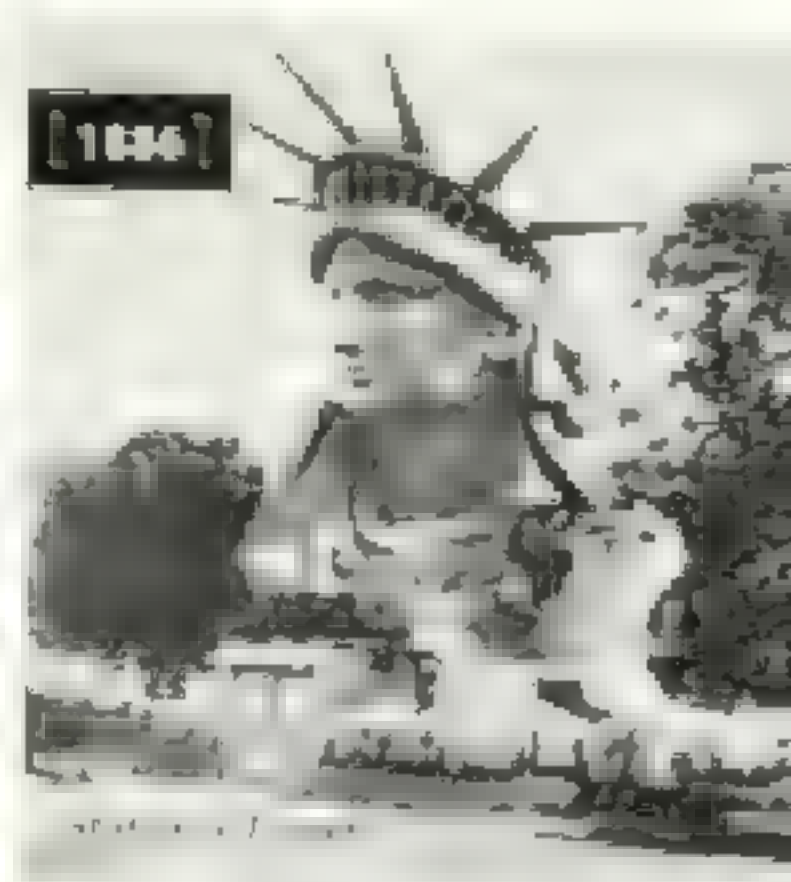
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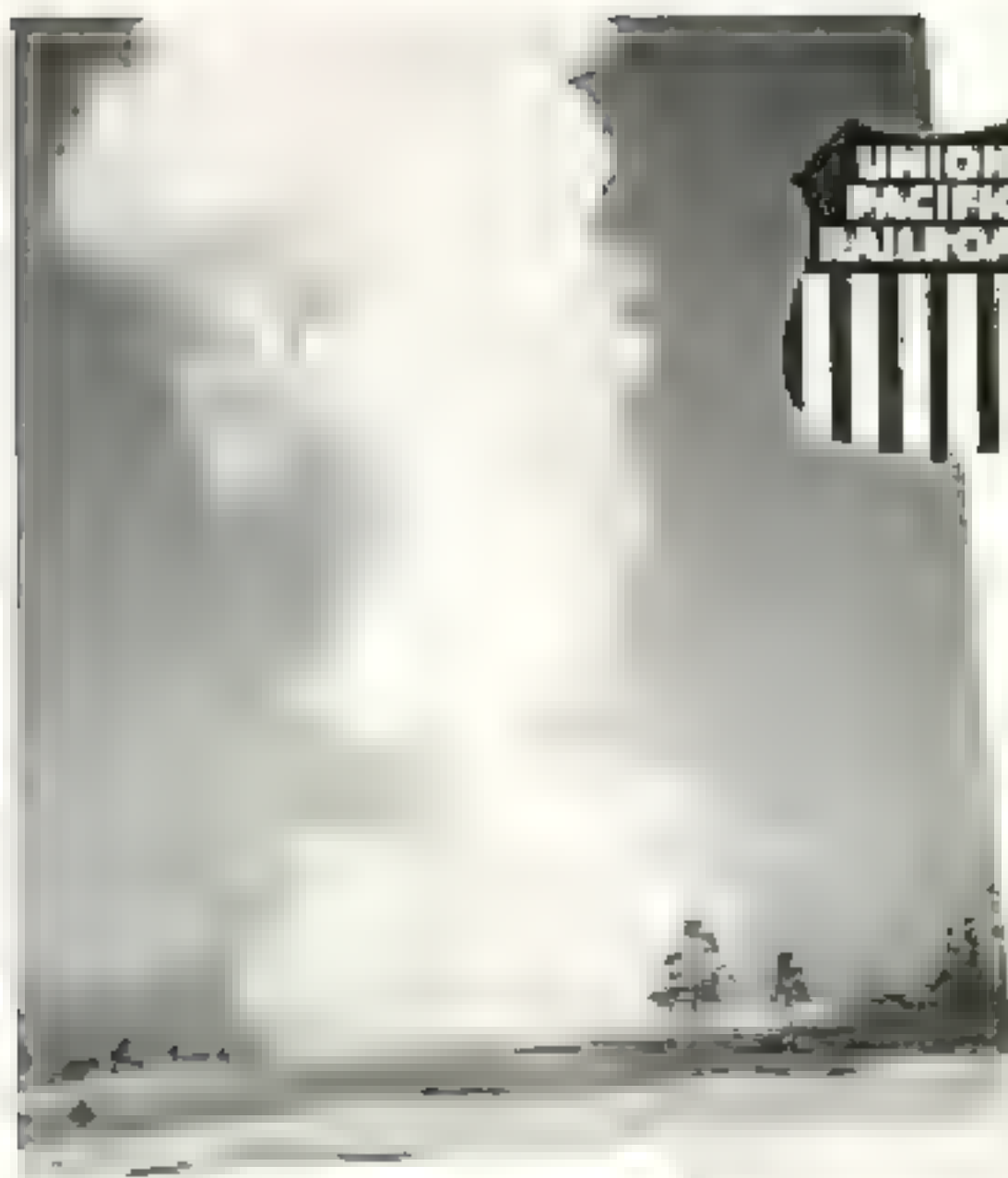
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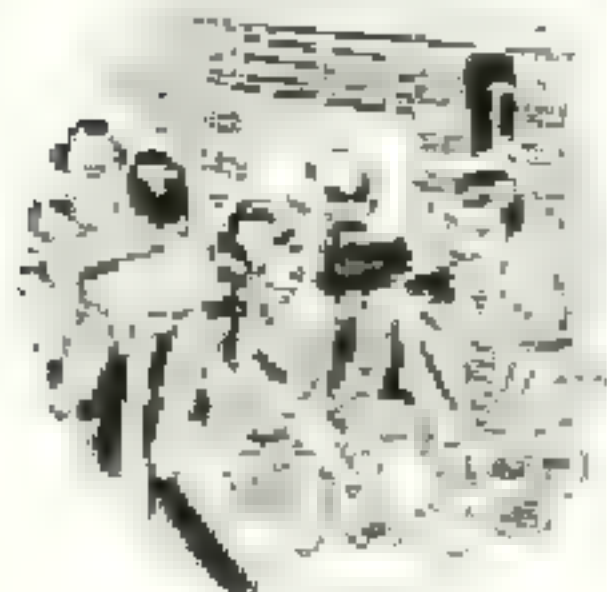
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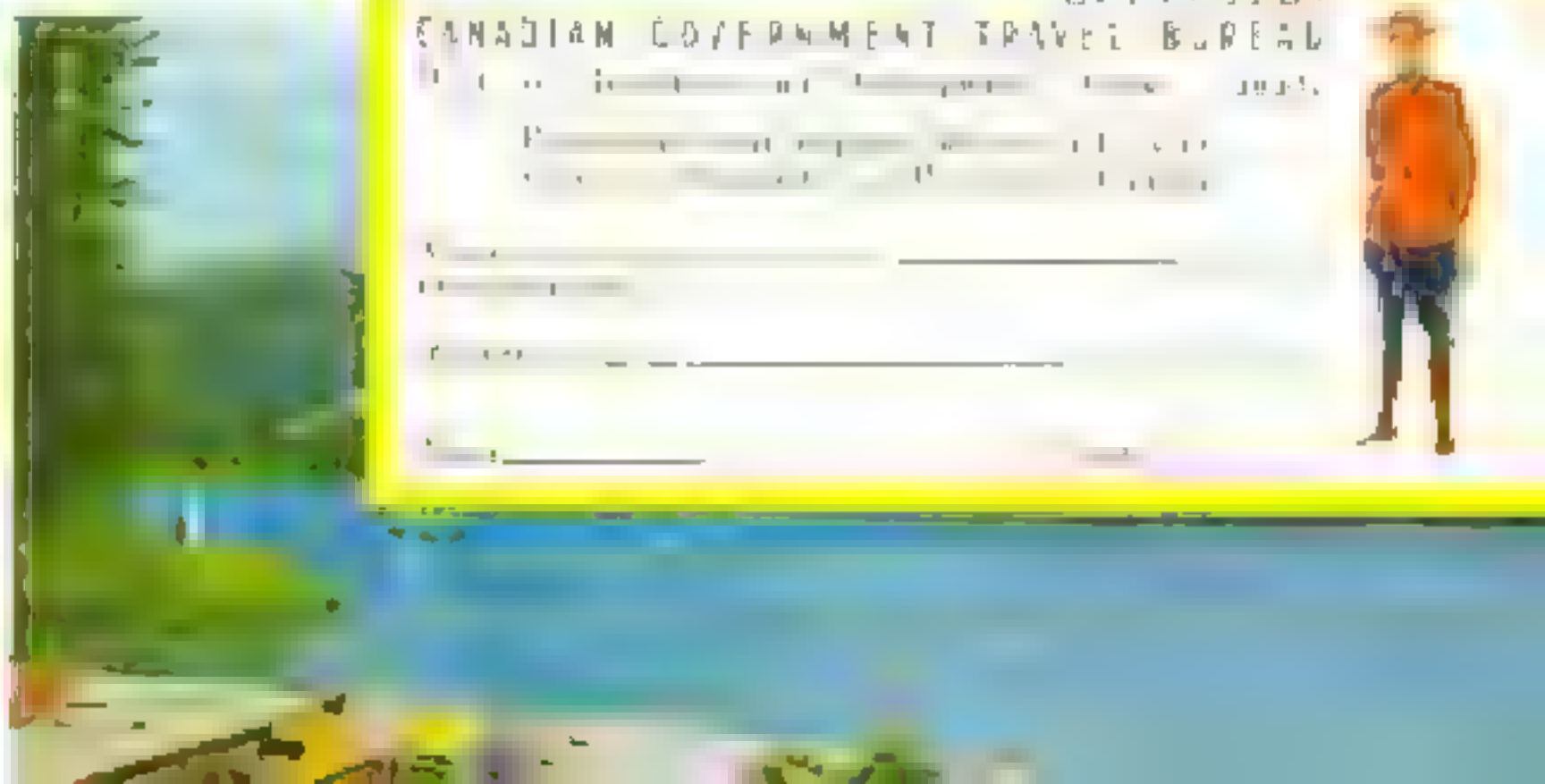
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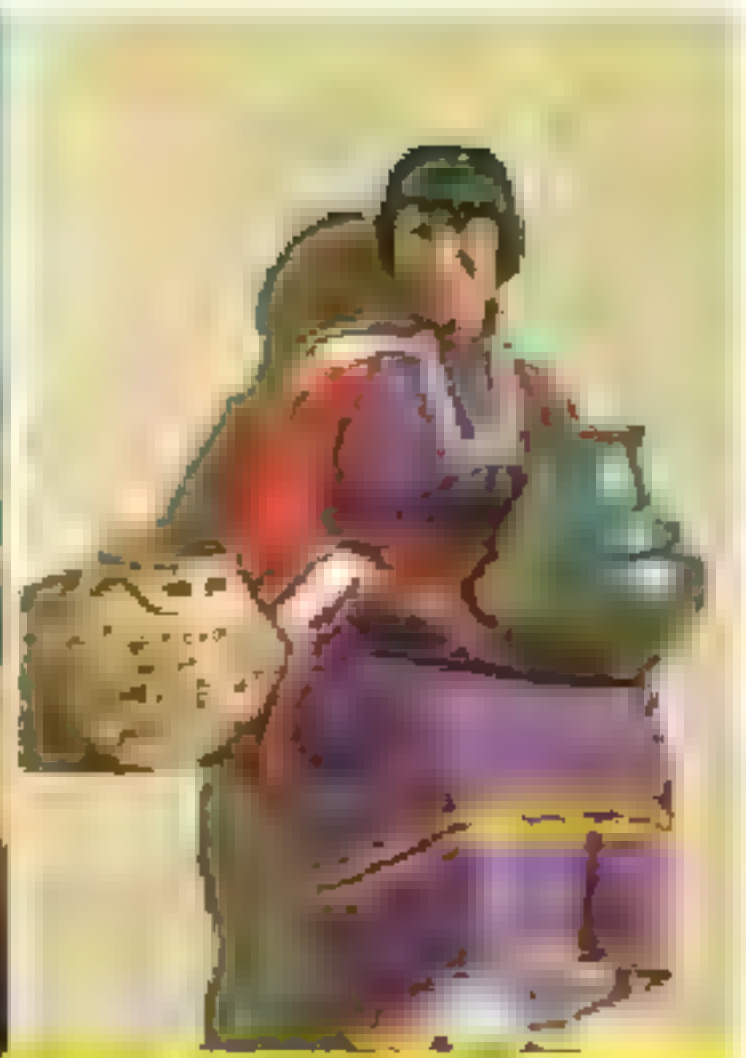
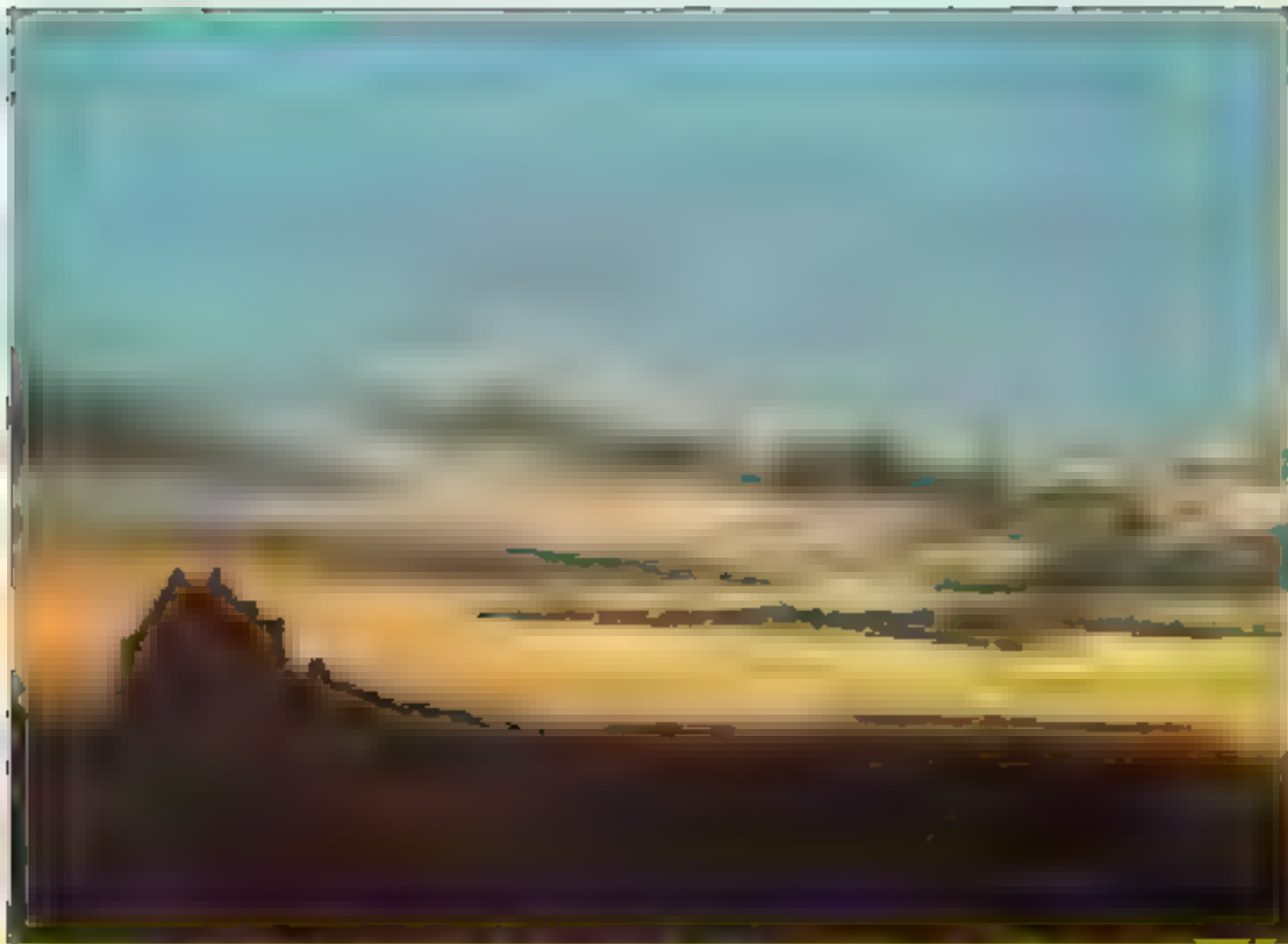
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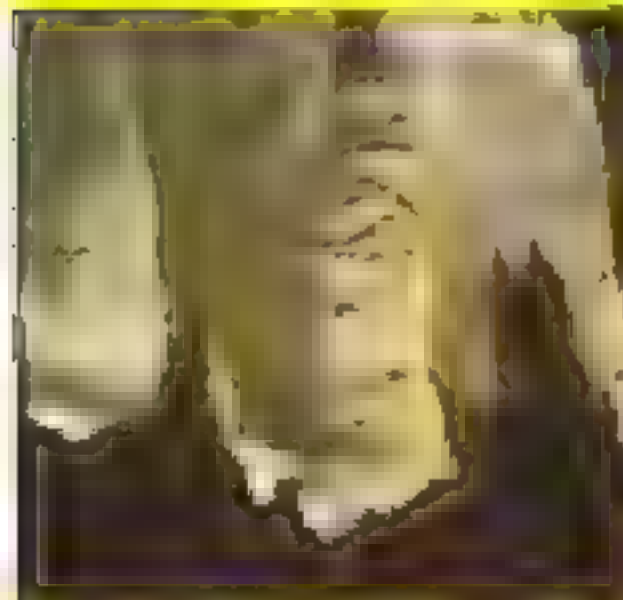




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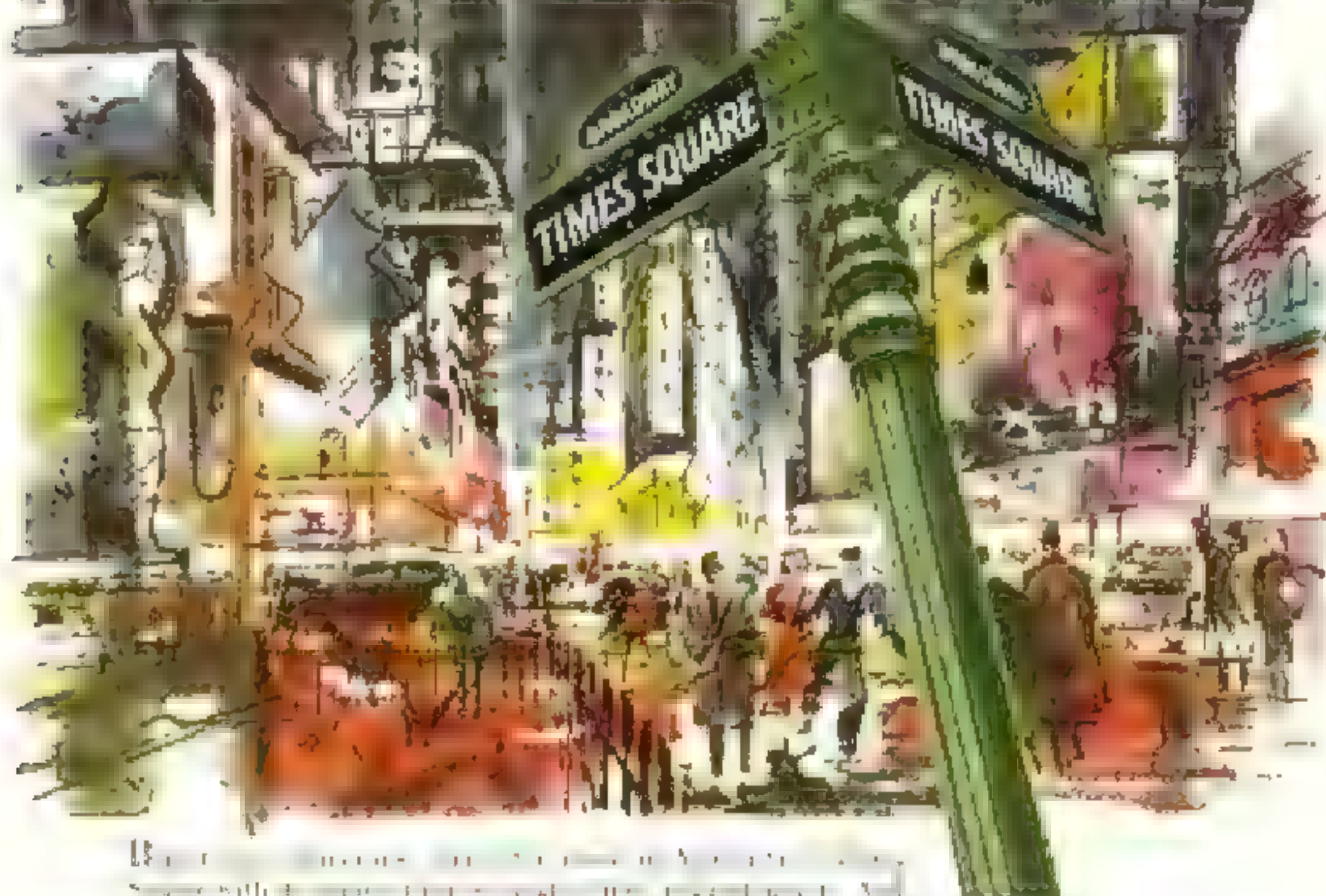
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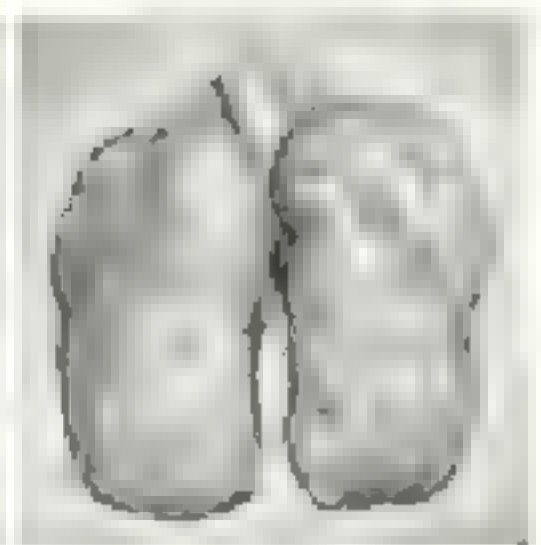
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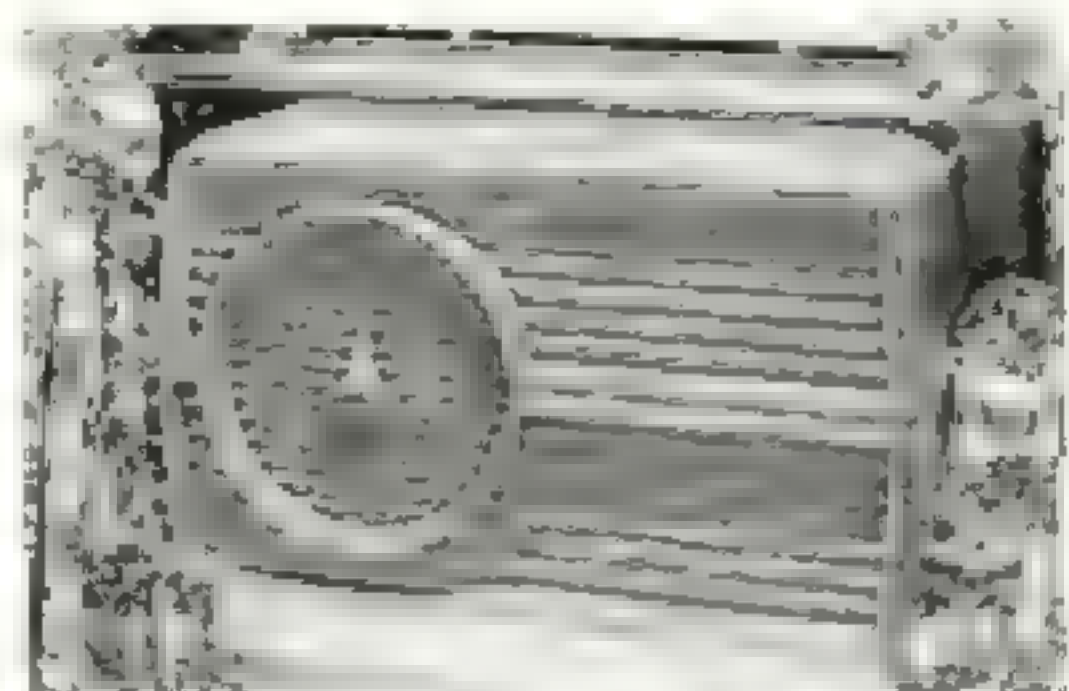


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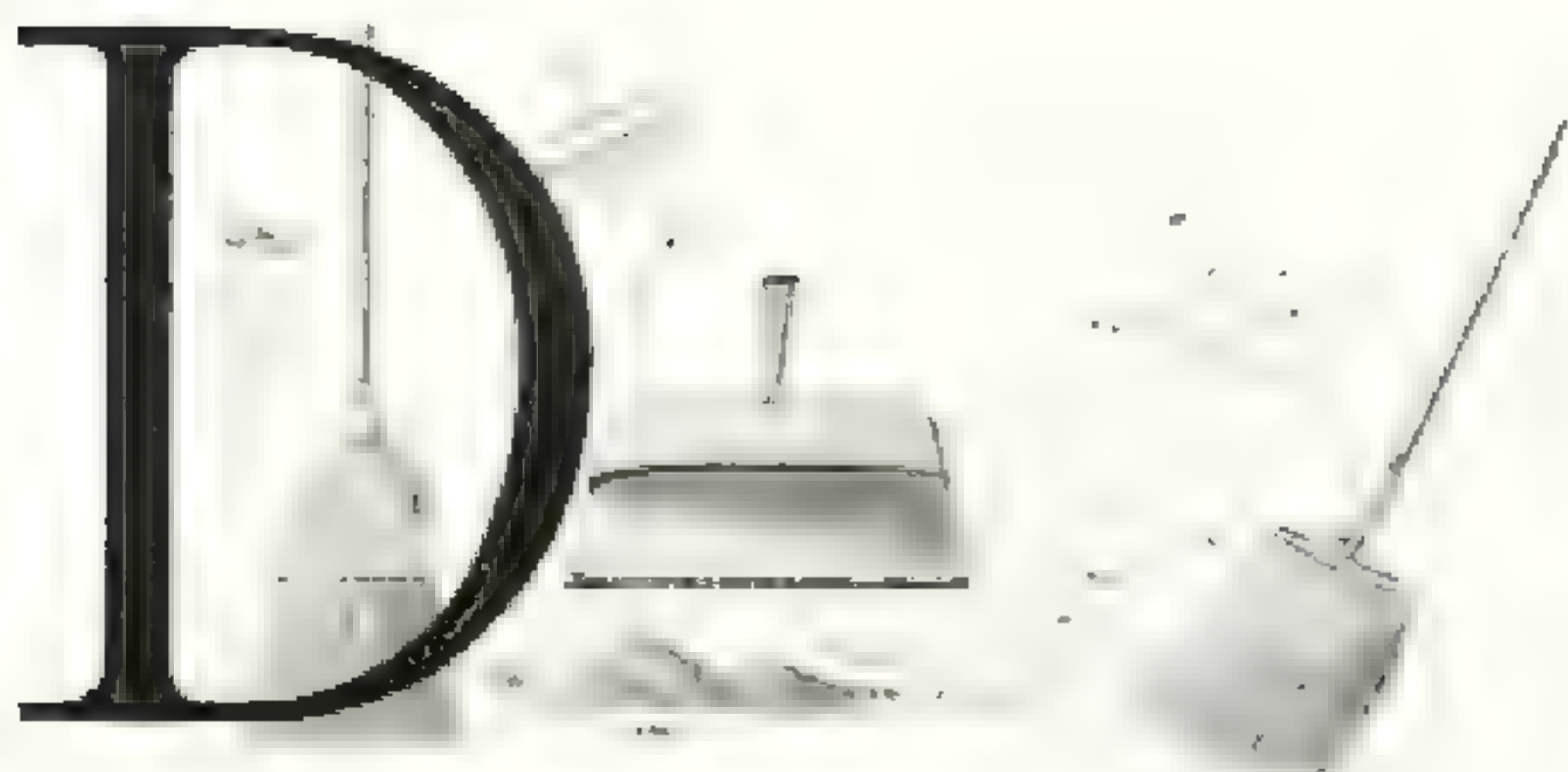
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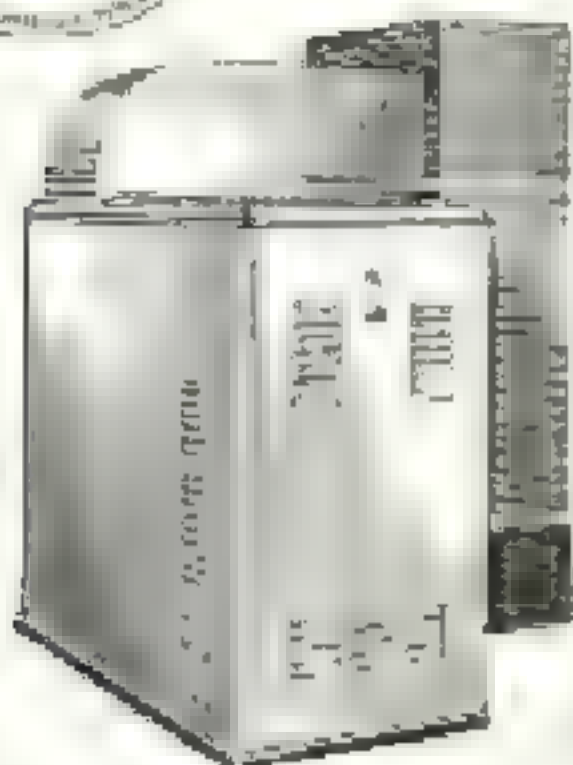
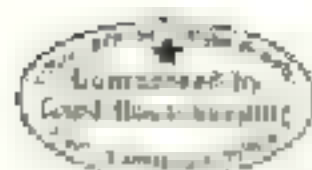
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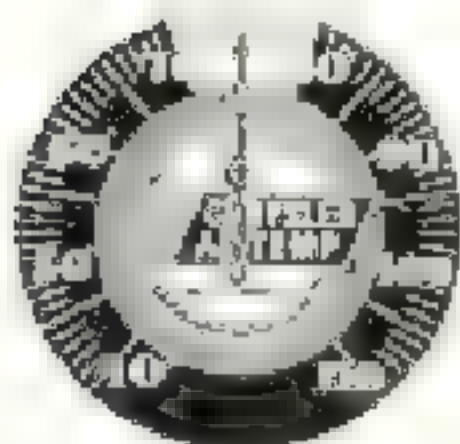
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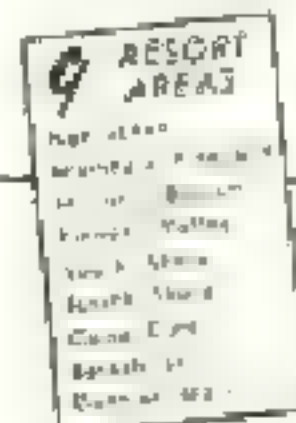
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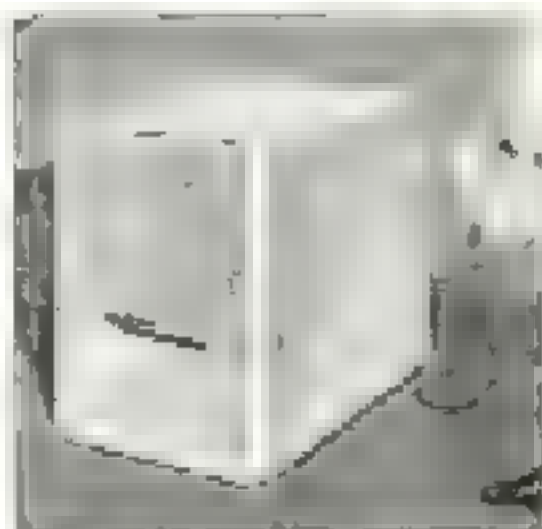
Figure 1. The β -phase of C_{60} is a $\sqrt{3} \times \sqrt{3}$ superlattice of the α -phase.

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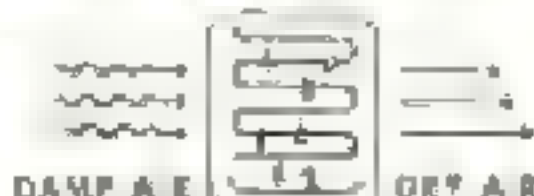
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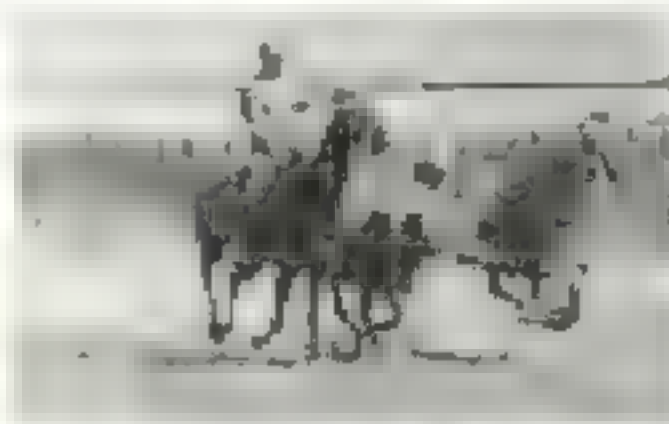
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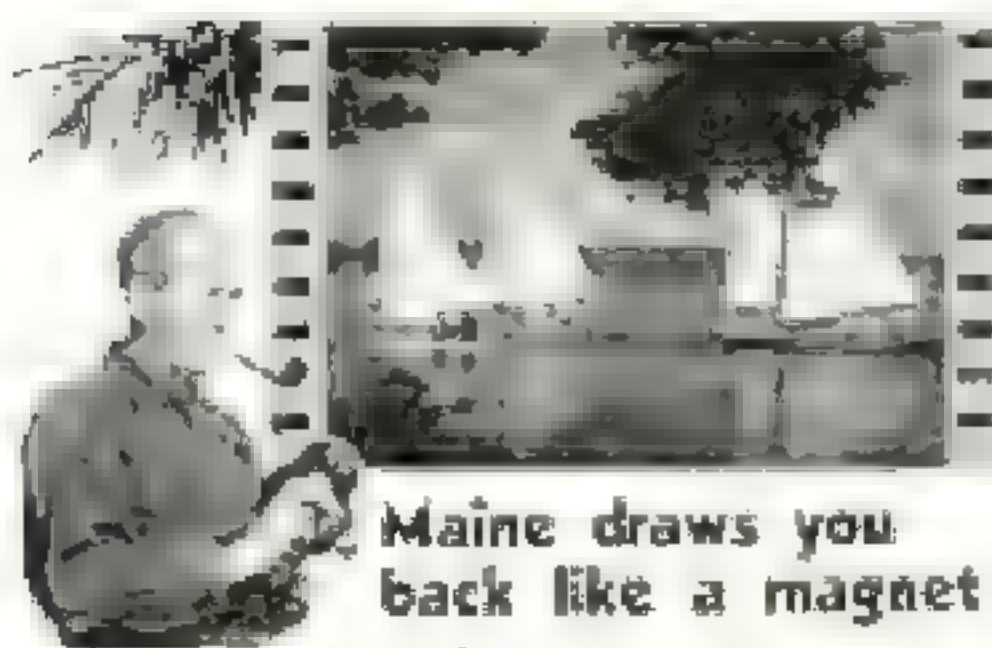


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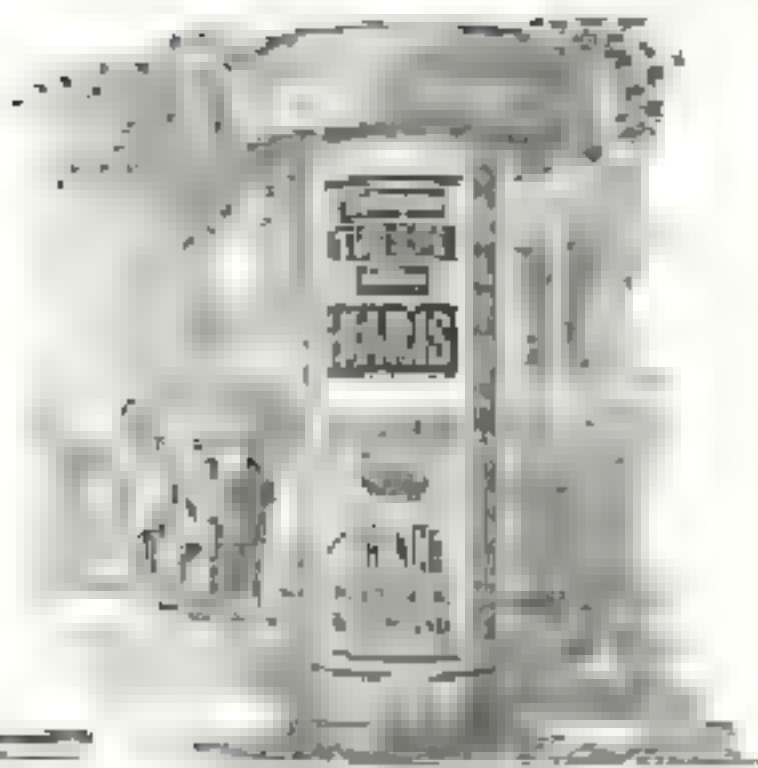
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[1] J. A. Roberts, *On the structure of the Lie algebra of derivations of a free Lie algebra*, *Journal of Algebra*, vol. 10, pp. 562–570, 1968.
 [2] J. A. Roberts, *On the structure of the Lie algebra of derivations of a free Lie algebra*, *Journal of Algebra*, vol. 10, pp. 562–570, 1968.
 [3] J. A. Roberts, *On the structure of the Lie algebra of derivations of a free Lie algebra*, *Journal of Algebra*, vol. 10, pp. 562–570, 1968.

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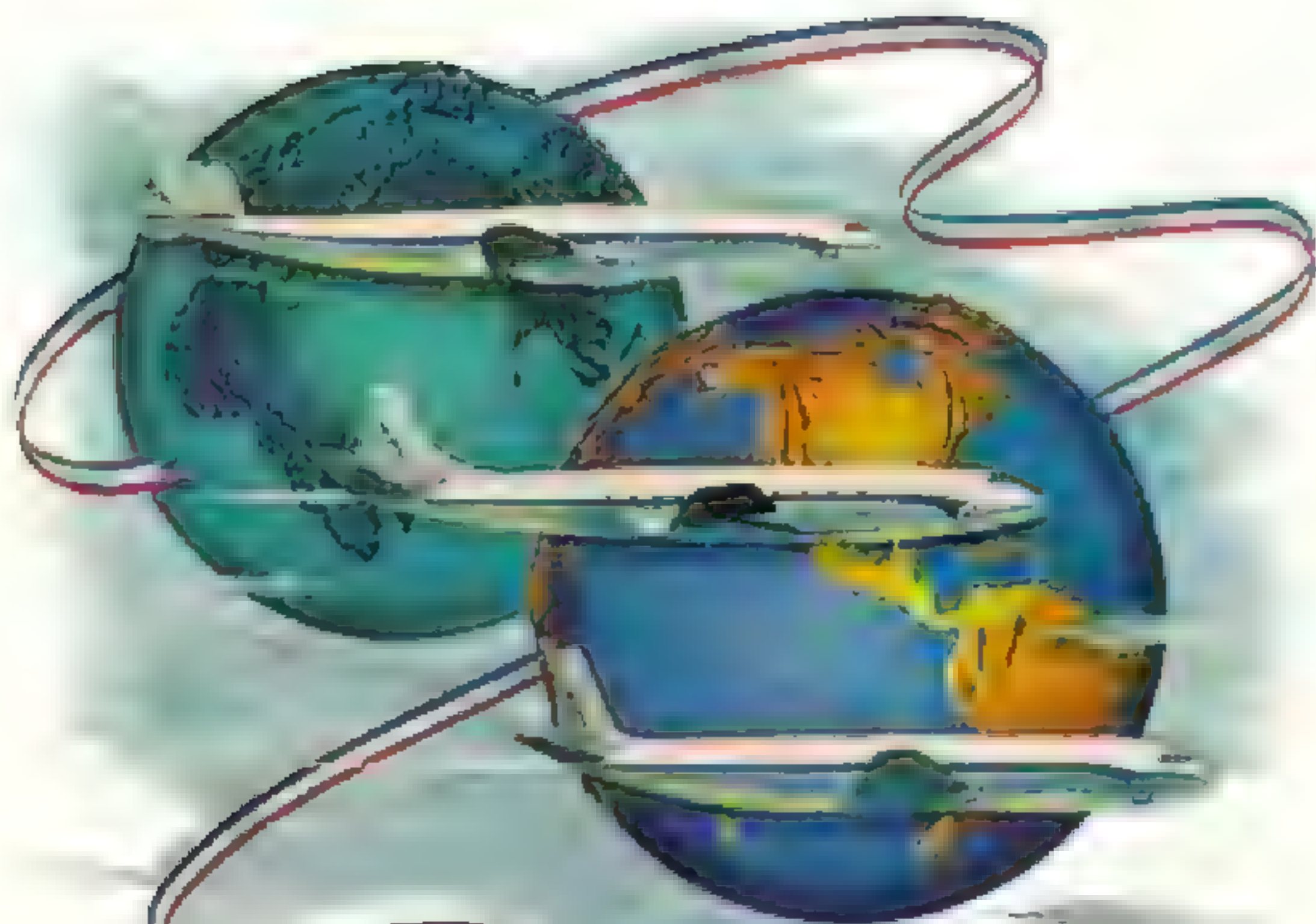
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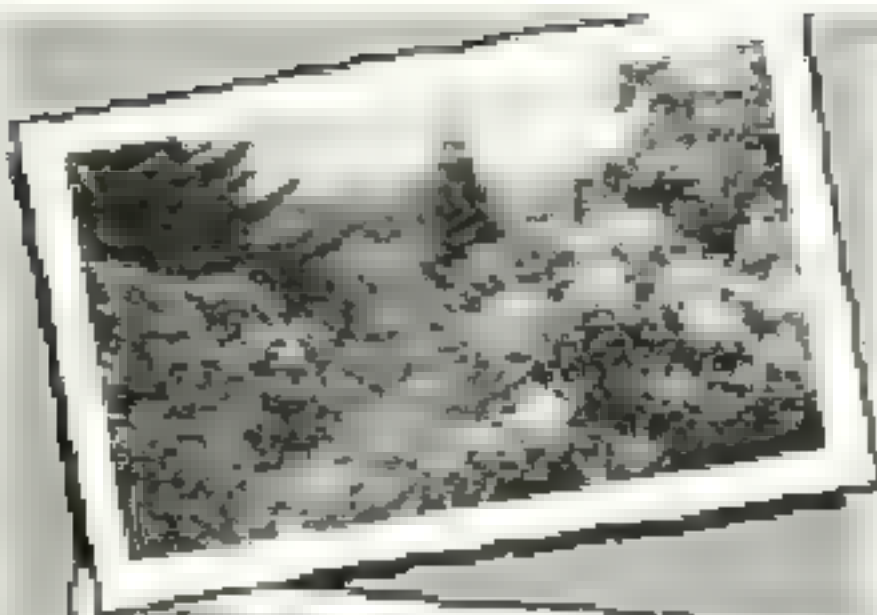


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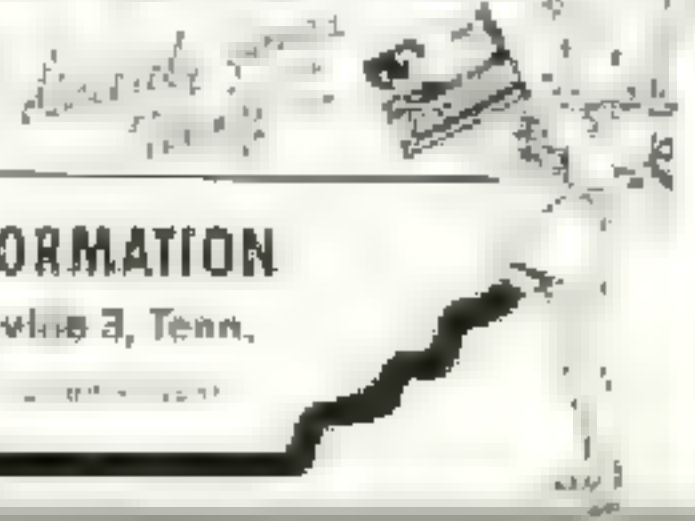
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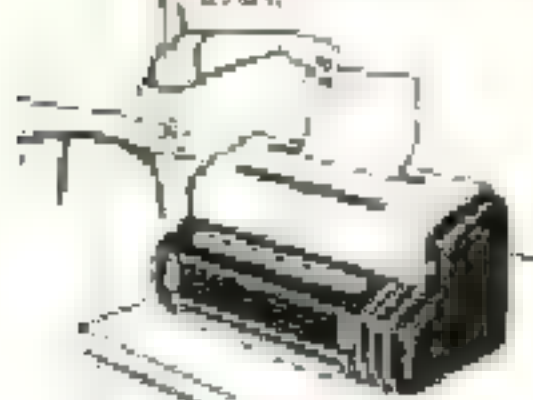
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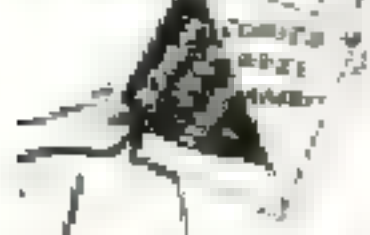
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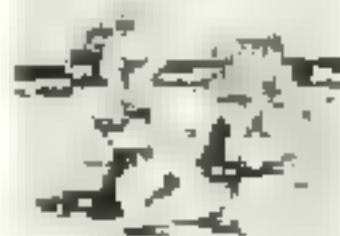
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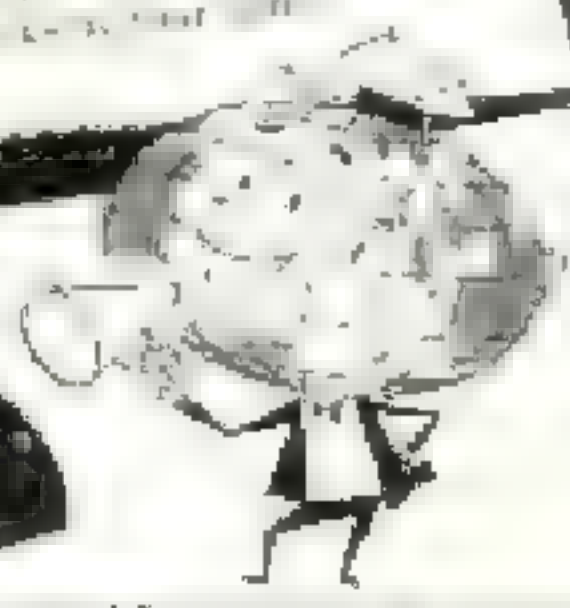
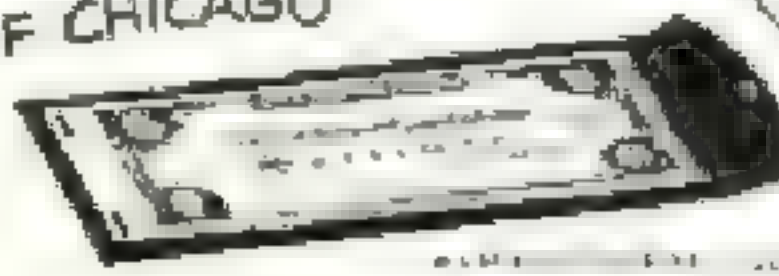
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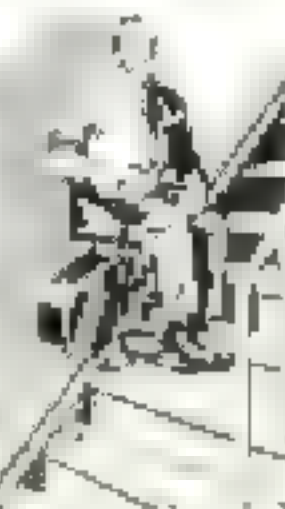
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A MESSAGE OF HOPE ABOUT CANCER

Each year, according to the American Cancer Society, an estimated 70,000 persons recover from cancer. The Society also estimates that the number of cases that are now saved could be doubled if patients received prompt and thorough medical or surgical treatment.

Today there is hope for even greater gains in our fight against this disease. This is because medical research is constantly yielding new facts about how and why cancer develops.

Some recent research findings

In surgery—major operations can now be performed with far less risk to cancer patients. Largely because of greater surgical skills, the number of patients recovering from cancer of the head, neck, stomach, and intestines has been more than doubled over the past few years.

In chemotherapy—or treatment with chemicals—encouraging success is being made. Some chemical substances are now being used which temporarily inhibit the growth of a few types of cancer in laboratory tests.

In radiology—or X-ray treatment—intensive

studies are under way on devices that are not only capable of producing more powerful X-rays, but also offer hope of a more effective use of them.

What should everyone do about cancer?

First—learn cancer's warning signals which are listed below. Should any of them appear, report to your doctor at once. These signals do not invariably mean cancer. In fact, in the majority of cases the suspected symptoms are proved *not* to be caused by cancer.

Second—have periodic health check-ups. Cancer may develop without any outward warning signals. Only examination by a physician may discover these "silent" cancers in their early stages. This is why periodic medical examinations are so important, especially for older people.

Third—do not rely on unproved methods for the treatment of cancer. Only surgery, X-rays, radiation—used singly or in combination—can remove or destroy cancer.

Above all, remember that cancer is often cured . . . and that getting to your doctor early is your greatest contribution toward recovery.

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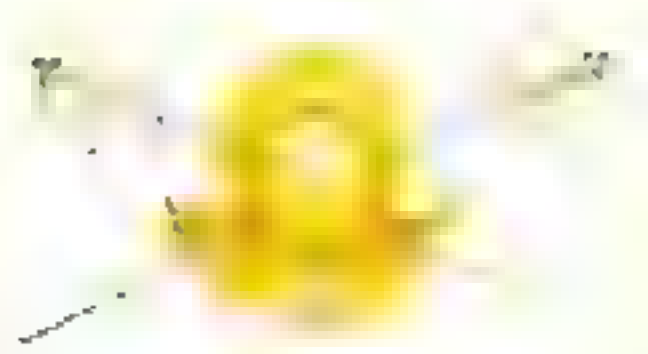
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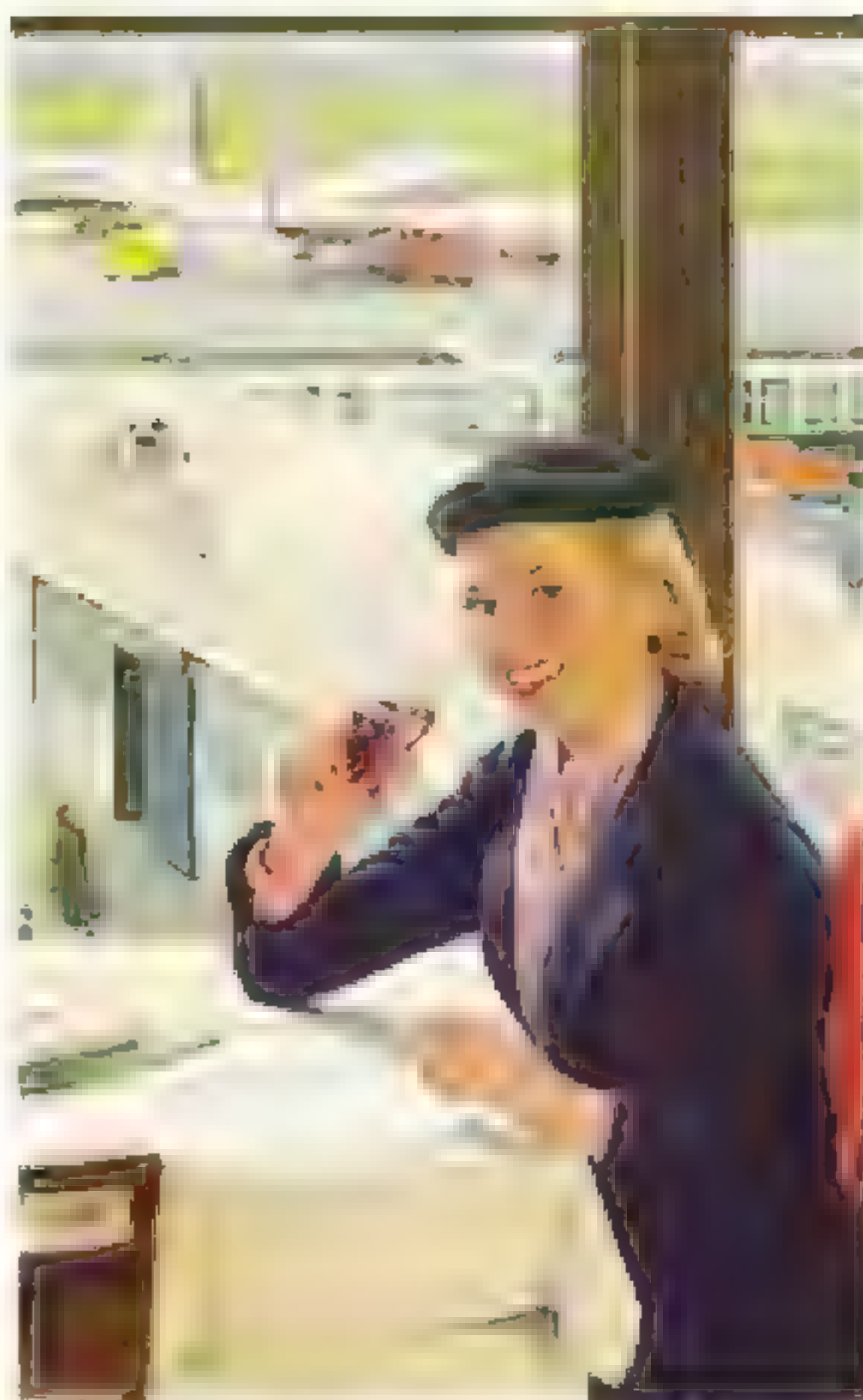
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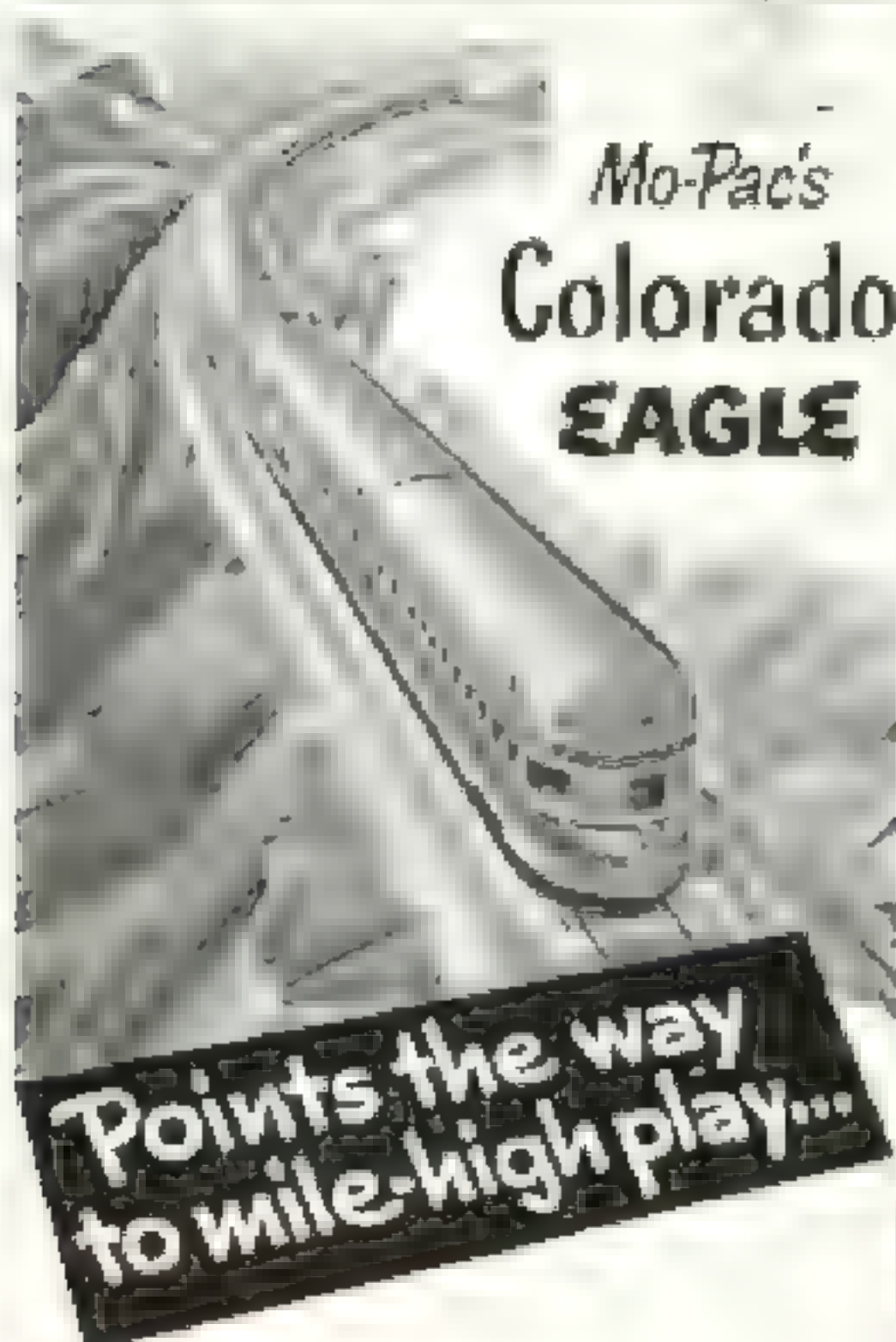
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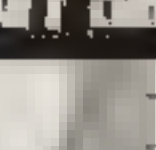
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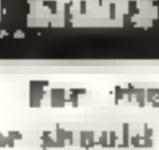
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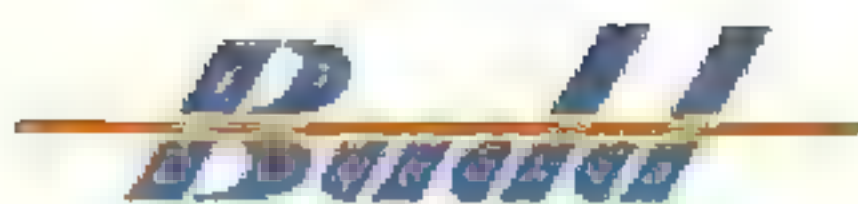
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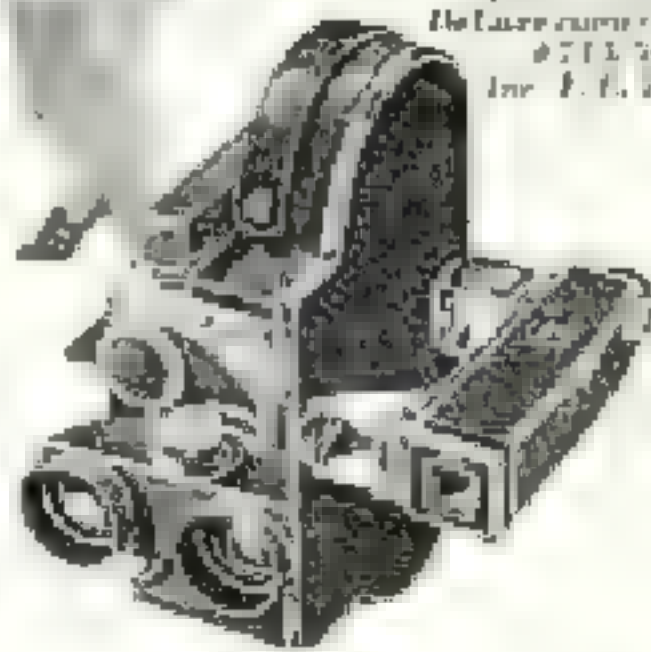
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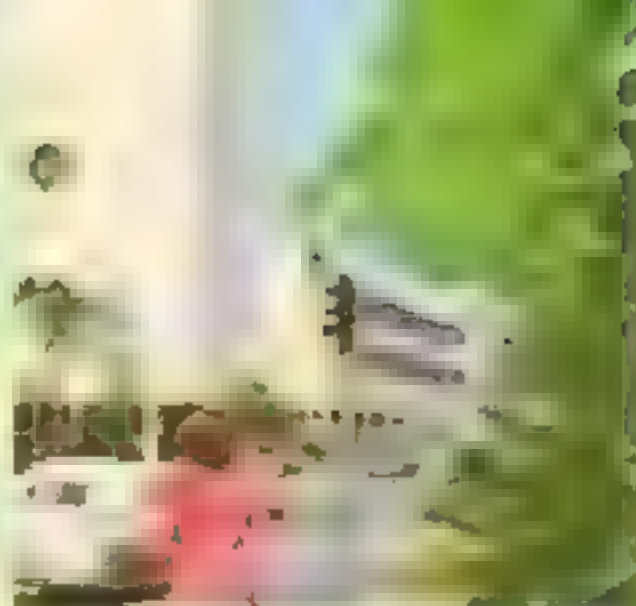


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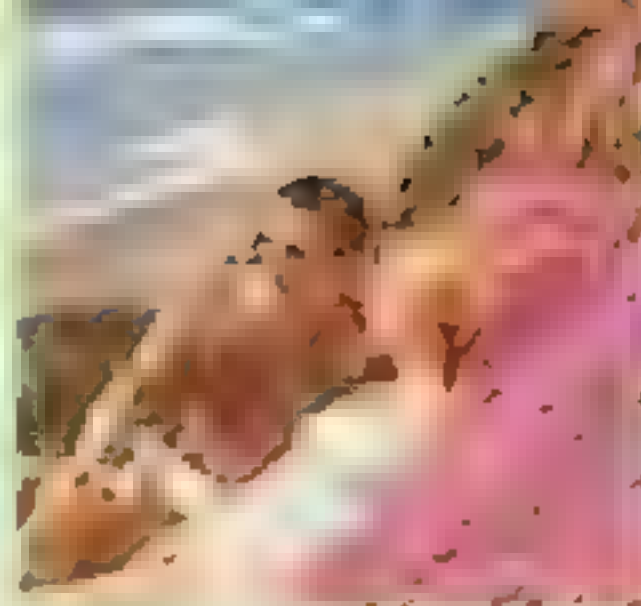
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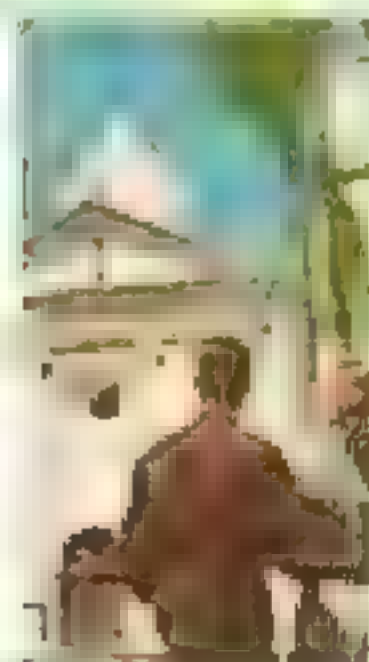
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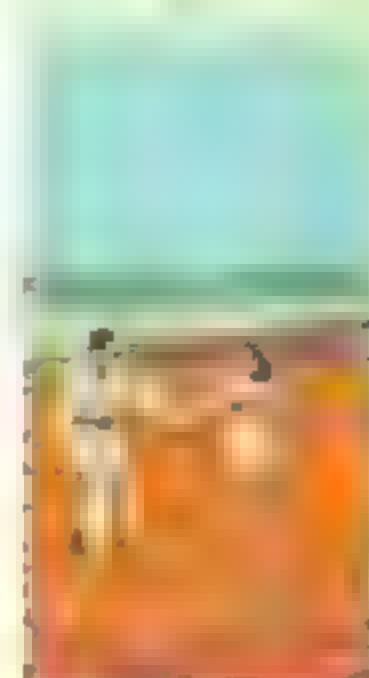
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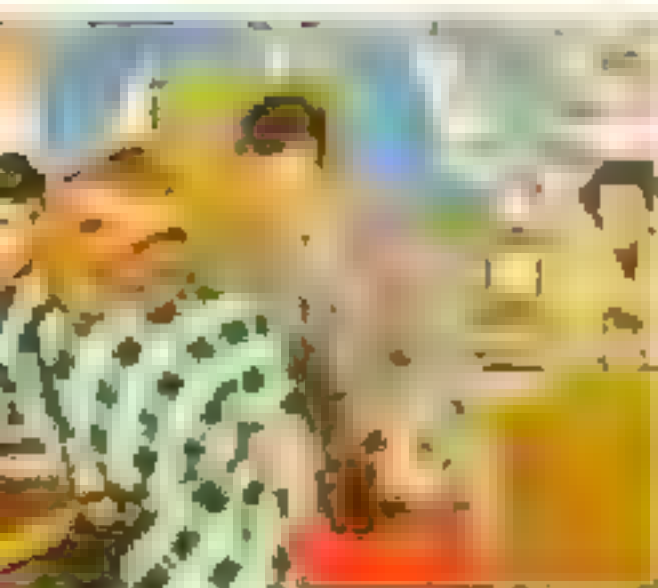
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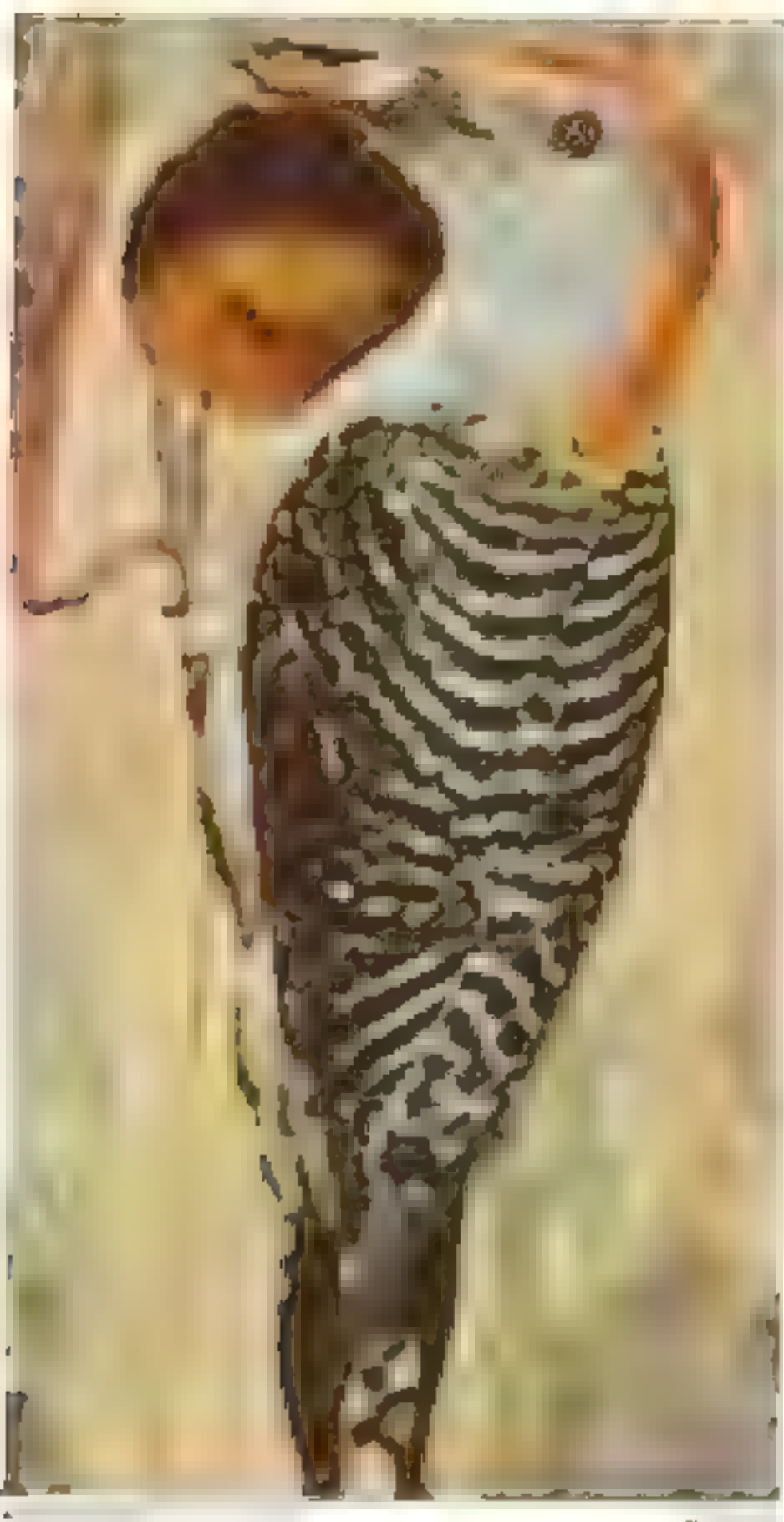
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▲ Northern Pike (top) and May Kill (bottom)

▲ May Kill (top) and Pike (bottom)



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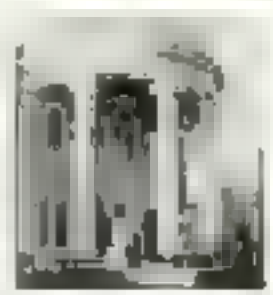
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4-53

Mention the National Geographic—It identifies you.



The Daisy... Its Symbolism: The flower that says to little children, "He loves me, he loves me not," that speaks of youth and innocence and hope... and like a prayer, keeps its face toward heaven. In older times it was called the "Day's-eye" because it opened by day and went to sleep at night. In monument symbolism, the Daisy portrays the innocence of the Holy Child and is often used to express a gentleness of soul.

"My daughter and I remember..."



"We remember what she meant to us—every day of the year.

"For how can we forget her slow smile . . . her cheerful voice . . . the love she gave to both of us?

"Putting flowers on her grave is one way to kind of tell her that we still love her. And her monument, too. It's strong and graceful—and goodlooking—just like her.

"The loveliness of our family monument in our cemetery is a perfect expression for one as fine as she. We go there often, my little girl and I, to see how beautiful her resting place is, and to remember how wonderful she was."

To capture in granite the personal sentiment you carry for the memory of a loved one is an artistic achievement. Authorized Rock of Ages Dealers are selected monument craftsmen. On their finest memorial tributes, you will always find the Rock of Ages trademark seal.

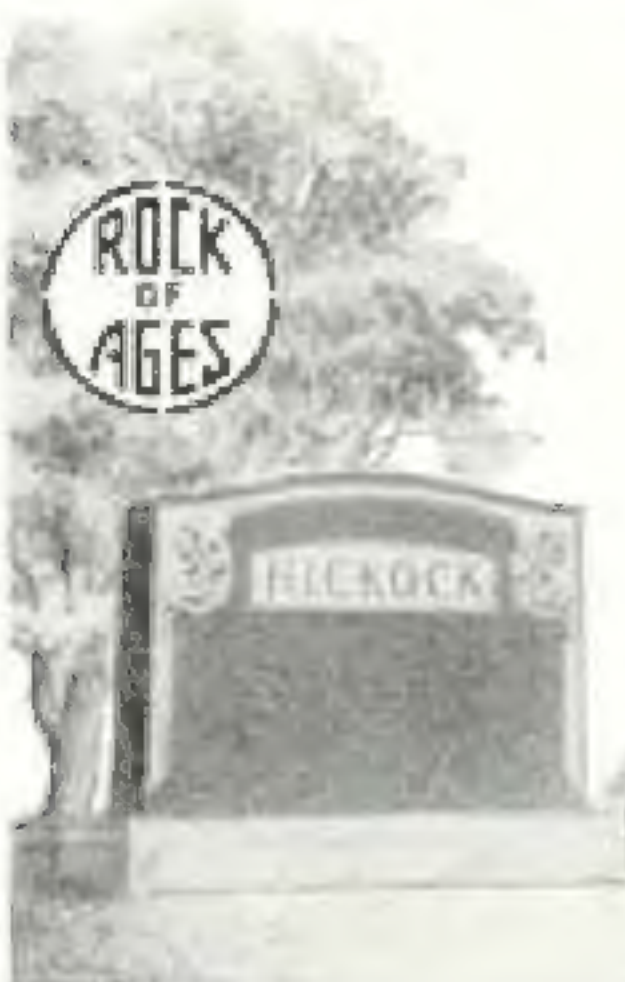
Ask your Authorized Rock of Ages Dealer for a free copy of "How To Choose a Family Monument." You'll find his name in the Classified Section of the Telephone Directory, or write Rock of Ages, Barre, Vermont.

ROCK *of* AGES

Barre Vermont

BARRE GRANITE FAMILY MONUMENTS

Before you choose, compare—ask your Rock of Ages Dealer to show you proof of permanence in any cemetery.



Mention the National Geographic—It identifies you

"You could never without a telephone"

by Ann Loeb

The telephone is used in sending many different messages. Here are some of them:



It helps report fires, floods and that people have fallen into deep water and need a doctor very quickly.



Children use the telephone by inviting other people to parties or other children to come over and play, and it is used in telling each other news.



Housewives use it for calling the grocery store for orders.



Fathers use it in business.

The telephone was invented by Alexander Graham Bell. It was born June 2, 1875.

"You could never without a telephone — and use manners if you are listening or talking."

The telephone is one of our great friends today, so take care of it.

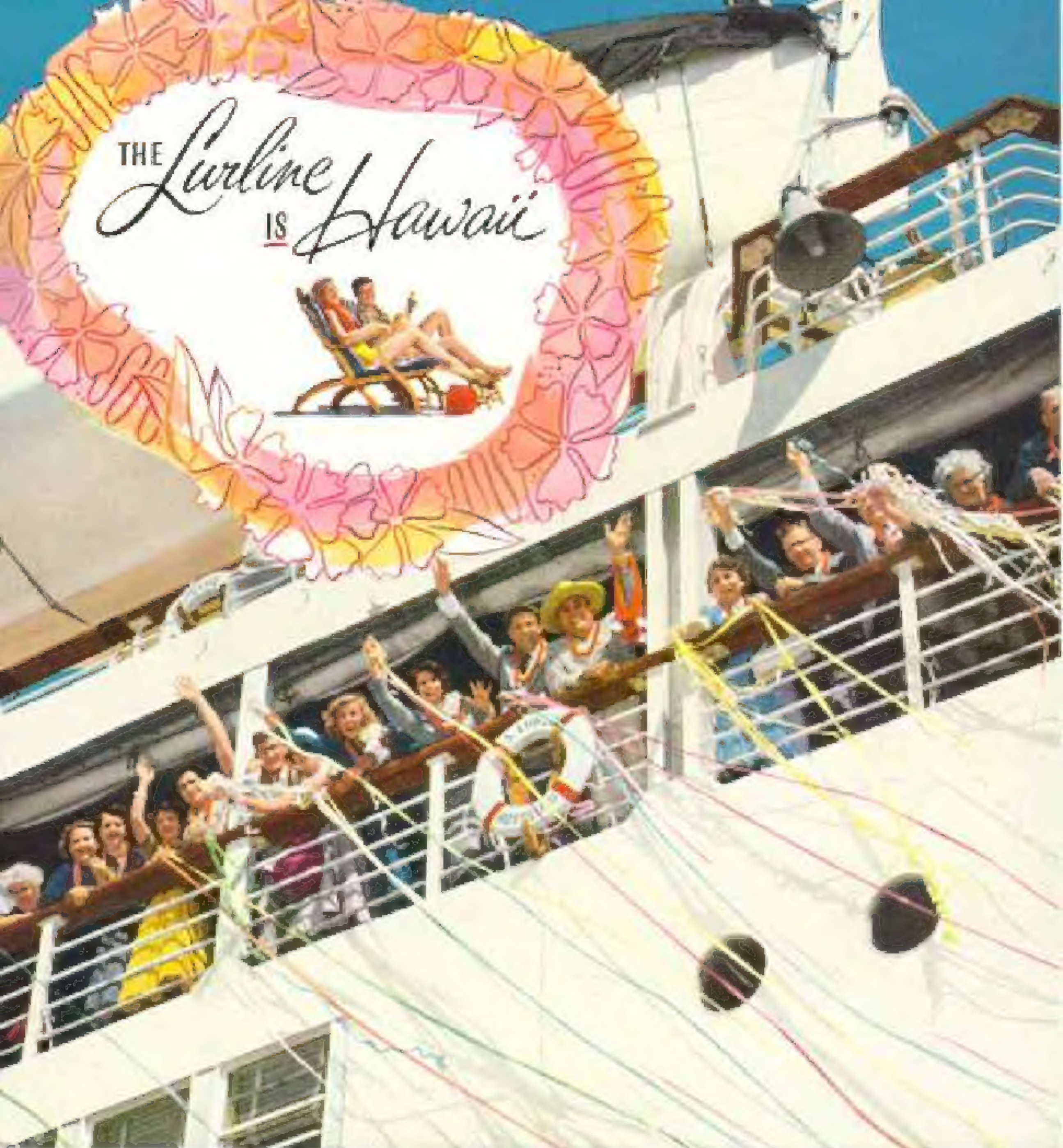
The End



When Ann Loeb wrote this third-grade theme in her school in Ottawa, Illinois, she had no idea her father would send it to the telephone company. Not a word has been changed. The handwriting is Ann's. So are the pictures, which she drew later at our request.

BELL TELEPHONE SYSTEM





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Cascades of color tumble from the deck . . . the serpentine breaks . . . then, with Island songs voicing the promise of Hawaii, the LURLINE gently moves into the setting sun. The shore line disappears . . . and you soon discover Hawaii's special charm is everywhere on this lovely liner. You see it in the soft, strange beauty of the LURLINE . . . you sense it in the gaiety and friendliness of ship sports and parties;

of movies, dancing and relaxing with congenial ship-mates . . . you experience it in the wonderful food and thoughtful service, in the luxurious comfort of your accommodations. In it all you see reflected over seven decades of Matson experience on the Pacific . . . and it's all included and twice enjoyed in your round-trip fare.

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